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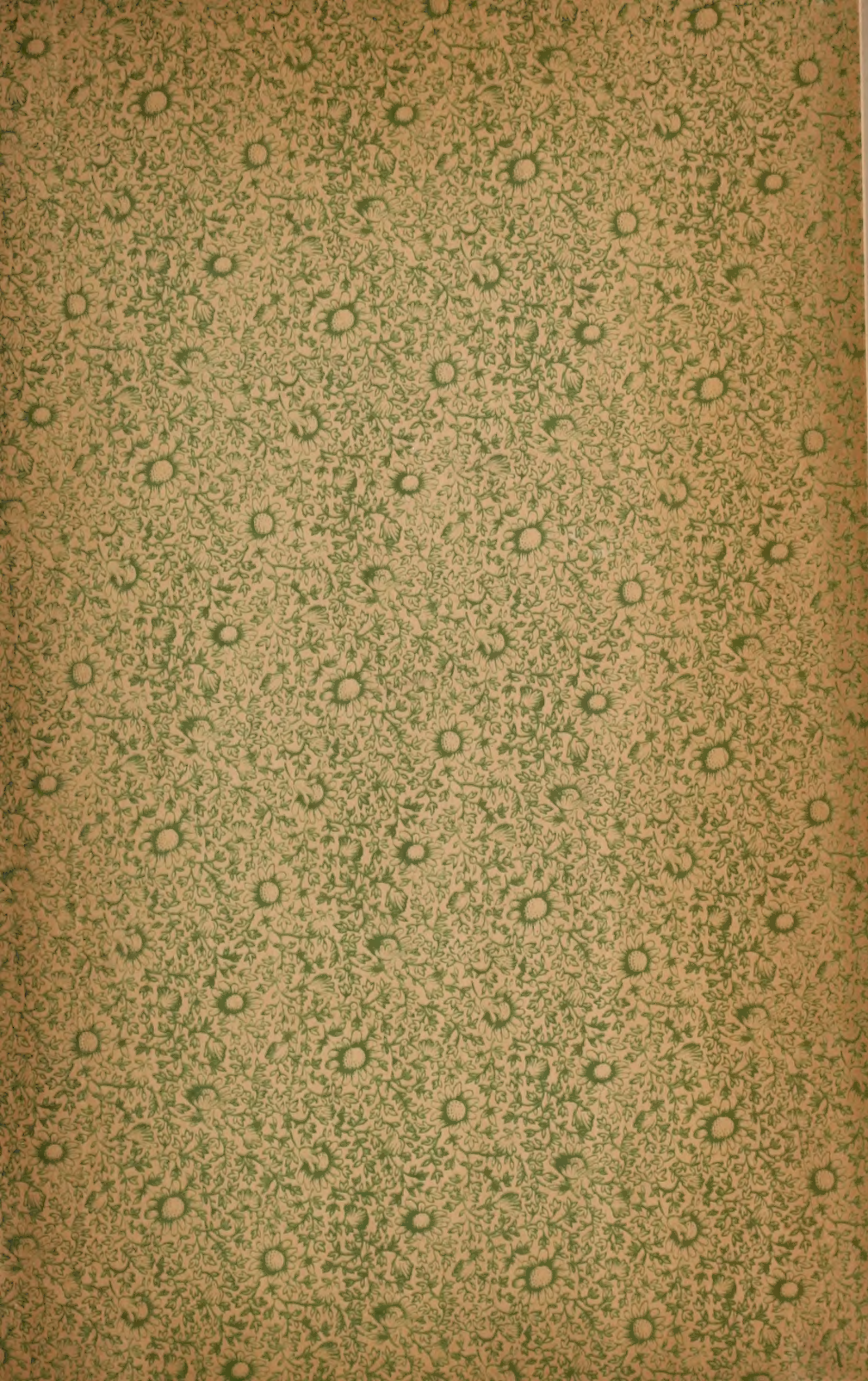
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THE DENTAL REVIEW.

DEVOTED TO THE ADVANCEMENT OF
DENTAL SCIENCE.

EDITOR:

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THE
DENTAL REVIEW.

VOL. XI.

CHICAGO, JANUARY 15, 1897.

No. 1

ORIGINAL COMMUNICATIONS.

FRACTURES OF THE MAXILLÆ*.

BY THOMAS L. GILMER, M. D., D. D. S., CHICAGO, ILL.†

Fractures of the maxillary bones are by no means rare occurrences, but the lower jaw is much more subject to this sort of injury than the upper. Among the causes of this injury, are, falls from heights, accidents by elevators in buildings, blows from individuals, kicks from animals, street cars and railroad locomotives or cars.

These fractures are usually compound and not infrequently complicated, both adding to the difficulties in treatment. Teeth may be broken off, loosened, knocked out or forced into the jaw. The bone may be crushed into comminution, or there may be serious contusions and lacerations of the soft tissues, or all these conditions may be present.

The indications of a fracture are mobility, crepitation, displacement, pain, swelling and a marked increase in the flow from the salivary glands; the latter is especially true if the injury be on the lower jaw, as the movement of the fragments on one another in the act of swallowing or speaking causes pain, which has the tendency to excite salivary action. Mobility is a result of a break in the continuity of the bone. Crepitation, of the roughened ends of the fragments rubbing upon each other. Displacement, pri-

*Read before the Odontographic Society of Chicago.

† In this article I have made a few brief quotations from a paper read by me before the Illinois State Dental Society in 1881, and published in the *Ohio Dental Journal* and other dental publications.

marily, on the lower jaw, is due to the force which caused the injury, and, secondarily, and more persistently, to the contraction of the muscles. The pull of the opposite pairs of muscles are exactly balanced, and so long as the continuity of the jaw is intact, their influence is not observed, except in their normal function, but as soon as a division occurs, if the break be of such a nature as to permit the fragments to overlap each other, or the obliquity of the line of fracture is such as to allow one fragment to be pulled away from the other, displacement is certain. Displacement is most marked when there is a double fracture, one break, say, on a line with the second bicuspid on one side and the second molar on the opposite. In such a case I have seen the anterior portion of the

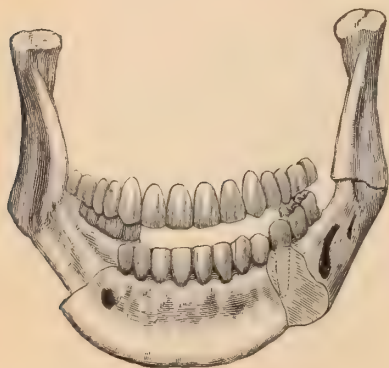


FIG. 1.

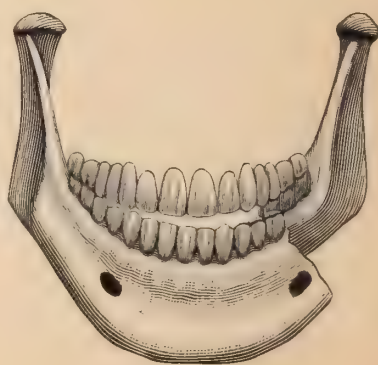


FIG. 2.

jaw drawn so much downward and backward as to render the patient unrecognizable. (Fig. 1.) If there be a single fracture, say, on a line with the second bicuspid, the posterior fragment is drawn upward by the masseter, inward by the mylo-hyoid, and inward and upward by the internal pterygoid muscles (Fig. 2).

Displacement on the upper jaw, when fractured, is not usually caused by muscular contraction, but the force which caused the injury, generally displaces the fragments to a greater or less degree. Fractures on the upper jaw are more likely to be simple breaks of the alveolar process, by force exerted upon the teeth, driving them into their sockets in the bone, or by the teeth being caught and forced lingually or buccally, carrying with them the process. However, I have recently had in my practice a case in which the entire upper jaw, with all of its

appendages, was broken from its bony connections and dropped pendulous at least one-half an inch from its normal position. This injury was received in such an unusual manner that it may be worth the time to relate how it happened. Mr. K. was walking on Ellis Avenue, in this city, going to take a suburban train. Just as he reached the railroad, which crosses this avenue near Forty-first Street, the cars were being switched from one track to another, after this manner: The train of cars being moved were on one track and the locomotive on another. The cars were connected with, and being pushed by the locomotive by means of a piece of timber fitted into a socket on the engine for this purpose. The force exerted was greater than the piece of timber was capable of resisting and it broke in two, and one end flew and struck Mr. K. in such a manner as to tear the upper maxilla from its bony attachments, breaking the bones of the nose and otherwise dangerously injuring him.

In the treatment of these injuries, I shall not discuss those appliances or methods of treatment which once were approved, but now have been supplanted by more modern and less complicated and cumbersome means. As a rule, the least complicated method is the best. Bandaging, wiring the teeth anterior and posterior to the break, wiring through the bone, wiring the upper to the lower, wiring around the bone, Angle's bands, splints, or a combination of two or more of these methods are generally employed at the present time. In the treatment of fractures of the lower jaw, if there be but slight tendency to displacement, a four-tailed bandage may be employed, binding the lower to the upper teeth, using the upper teeth as a splint to hold the lower in their normal occlusion with the upper, thereby holding the fragments in their proper relation to each other. This method is generally considered wholly inadequate, except to those who have slight regard for the best possible occlusion of the teeth, and a good facial contour after the bones have united. This or other bandages are valuable adjuncts to other appliances, and are indispensable to give support to the parts while the other appliances are being constructed. Wiring the teeth anterior and posterior to the injury is not especially valuable on the lower jaw, but on the upper, where one or more teeth and the process are forced from their position, they may be replaced and the loosened teeth secured to the adjoining teeth which remain solid in the jaw, by

ligating them with small silver wire. Wiring through the bone may often be employed in difficult cases, or in cases where there are but few teeth remaining. To do this, drill two holes a little less than one-half an inch laterally to the fracture, through the bone, after having cut through the soft parts at about the duplication of the mucous membrane of the cheek with the gum. Form a staple of heavy silver wire, separating its two points so that they will just fit into the two holes drilled into the bone. Place this staple in the holes in the jaw from its lingual side, cut through the



FIG. 3.

gum so that the wire will rest on the bone and not upon the gum, bring the two ends together and tightly twist the wires until the two fragments are closely approximated. If outside injuries do not prohibit it, a plaster of Paris or other bandage should be used in conjunction with this method, unless some form of splint is employed which renders its use unnecessary.

Wiring around the bone was first employed by Dr. G. V. Black. It is a method which is employed in conjunction with some sort of splint resting upon the teeth. This method is only employed in cases where there are a number of fragments and

where there are complications which do not permit the employment of other or outside appliances. Its application is as follows:

A splint (Fig. 3) is made which caps the lower teeth, and is adjusted to the upper on its superior surface. A threaded needle with an eye in the point, such as is used by surgeons in the operation for vesico-vaginal fistula, is started in close to the fracture on the lingual side of the jaw, near the duplication of the mucous membrane and gum, carried down as closely as possible to the bone and curving under it, is brought out on the face below. A loop of its thread is secured, opened sufficiently, and the looped ends of two strong threads passed through it. The needle with its thread is then withdrawn, and the looped ends of the ligatures pulled through. The needle is now inserted on the face in the hole previously made, following the ligature until the bone is again reached, then changing the direction of the needle, it is made to follow the outer, or buccal side of the jaw upward, entering the buccal cavity. A loop of thread is again secured and the loop of a pilot thread passed through. The needle with its thread is now withdrawn, and a loop on the pilot thread brought through with it. We now have a pilot thread in the last opening made by the needle; through its loop we pass the free ends of the ligatures introduced in the first needle hole; now, by withdrawing this pilot thread the free ends of the ligatures are drawn through needle hole No. 2, and around the bone. We now have two double threads around the bone. The loop of one of these is used to draw in a heavy silver wire. This process is repeated until we have two wires and with them ligatures around each fragment. The splint is applied to the teeth which are firmly drawn up into their places by the threads being brought together over the top of the splint and tied so that they will receive a lever by which they may be twisted, thereby forcing the teeth firmly and securely into their places in the splint. This being done, the wires are brought together over the top of the splint and fastened, when the threads, having served their purpose, are removed.

One of the simplest and I believe best methods of immobilizing the fragments in the treatment of fractures of lower maxilla, if a number of teeth remain solid in each jaw, is to ligate the lower to the upper teeth by placing wires around the necks of several of the upper and lower teeth and twisting them tightly, then

securing the wires of the lower with those of the upper teeth, firmly locking the lower teeth in natural occlusion against the upper.

Angle's bands and clasp bands may be employed in a similar manner where there is space enough between the teeth for their application. Space may be had for this purpose if it is practicable to wedge, or the teeth may be separated by the file or disk. By projections on the buccal side the bands of the lower teeth are secured to the bands of the upper either by bolts and nuts or by wires.

Splints of various forms have been employed for many years. Universal splints, from the fact that no two jaws or sets of teeth are alike, are impracticable. Splints are formed upon casts made from impressions taken from the teeth. In most cases of fractures of the lower jaw it will be necessary to reconstruct the casts, even if there be no displacement as a result of the accident or muscular traction; the very pressure necessarily employed in securing the impression will in a measure displace the fragments, and consequently the cast made from such an impression will not represent the jaw previous to the injury. It is not practicable to hold the fragments in place while the impression is being secured. It is better to take the best impression possible of the teeth and jaw in their out of place condition, after adjusting the fragments as well as can be, and depend upon reconstructing the cast for an exact model of the case previous to the accident. An impression of the upper jaw is also secured and casts made of both. These impressions may be made of plaster or modeling composition, or what is better in some cases, a combination of both; i. e., take an impression first in modeling compound, cut out a small amount from its surface, put in as much plaster and retake in the plaster. This method gives an impression cup made of modeling composition which nearly fits the teeth and jaw, a matter of some importance when the fragments are much displaced. The lower cast is sawed in two on a line with the fracture or fractures, as the case may be, the teeth of these pieces are accurately articulated with the teeth of the upper cast. The several parts are now secured to each other by the addition of soft plaster. This gives a cast representing the jaw before the injury, and upon this may be formed any of the various kinds of splints.

Usually, in the treatment of fractures by splinting, if a simple

form is practicable it is the best. One of the most desirable of the simplest forms is that which I have called, for want of a better name, an open band splint (Fig. 4). It may be made from vulcanite, and is applicable for single fractures. To form it wax up a model on the lingual sides of the cast of the teeth and jaw, ex-

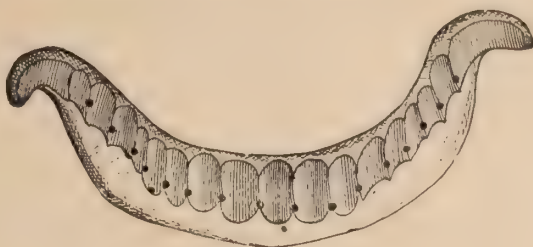


FIG. 4.

tending as far back on either side of the mouth as is necessary to afford stability when the splint is in place. When reproduced in rubber, drill holes into those parts of the splint which fit into the interproximal spaces, in order that it may be wired to a sufficient number of the teeth to immobilize the fragments. After its application the teeth are occluded and the lower jaw supported by bandage, the patient being fed on liquid food.

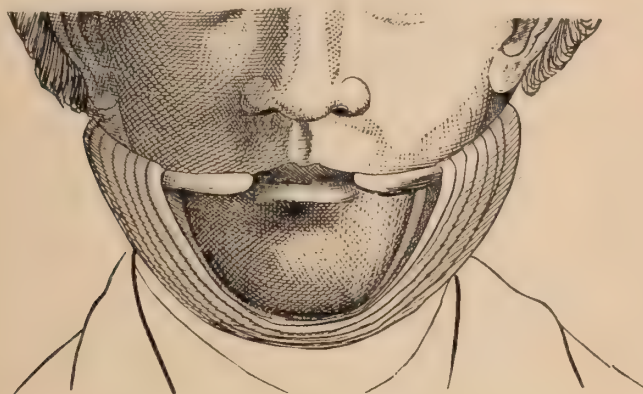


FIG. 5.

Kingsley's splint has merit as it not only gives firm support to the fragments, but permits the opening and closing of the mouth. It may be formed either from vulcanite or metal (Fig. 5). This splint is made to cover the teeth, and to it on its buccal sides are attached

heavy steel wires, which extend outside the mouth at its corners where it bends backward to a point reaching nearly to the ear. The splint is applied to the teeth and a bandage is carried from the wire on one side under the chin to the other side, and by this means the teeth are held firmly in the sockets in the splint. Owing to the small size of flasks and vulcanizers, it is difficult to vulcanize the wire into the splint. On this account, I have first vulcanized the splint and afterward attached heavy Stubb's steel wires. By forming a flange on both the wire and splint, as is represented in the splint I now show you, the wires will not rotate and are quite as secure as when vulcanized into the splint.

The splint I have used in a number of cases, is made similar to

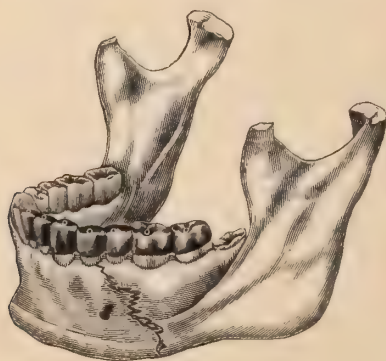


FIG. 6.

the one recommended by Heath (Fig. 6). This splint was invented by Dr. Angle, Dr. Martindale and myself, each supposing he had been its originator, when I discovered that Heath invented a similar appliance and described it in his first and more recent editions of "Injuries and Diseases of the Jaw." How such an excellent method could have been so little known during so long a time is a mystery. It is made by swaging a plate of metal to fit the teeth, extending anterior and posterior to the fracture, and then cementing it to the teeth with oxyphosphate of zinc.* This splint immobilizes the fragments, dispenses with outside appliances and permits the jaws, if there be two or three teeth posterior to the fracture, to be opened and closed at will, and used for masticating soft food. In the treatment of some fractures of the superior maxilla by splint-

* Heath employs gutta-percha for securing it to the teeth.

ing, this same appliance of Heath may be advantageously employed. If, however, the entire upper jaw be broken from its bony attachments, as in the case of Mr. K. before described, the Kingsley splint may be adapted to the case as it was in this instance, using instead of bandages a skull cap nicely fitted to the head, and the splint secured in place by straps and buckles, extending from the arms of the splint to the cap. The under side of the splint should be cut away so as to occlude nicely with the lower teeth. If the nature of the fracture permits the fragment when tightly held in place to move anteriorly, posteriorly or laterally, then the casts of the upper and lower teeth should be properly occluded and placed in an articulator, and the splint so formed as to include an imprint of at least one-fourth of the length of the inferior teeth on the lower side of the splint as a guide to the proper adjustment of the fragment. This splint may be cemented to the upper teeth, or it may be adjusted without fixing it, and removed occasionally after it has been in place a few days for cleaning. Fig. 7 is the invention of Dr. C. S. Case.* It is a submental splint which differs from other similar inventions, from the fact that the upright bar is slit through its whole length. This permits the elevation or depression of one or the other of the points which are attached to that part of the splint inside the mouth, and by this means a greater or less force may be applied to either side should occasion demand it. Frequent antiseptic cleaning is desirable with all kinds of splints used in the mouth.

GENERAL CONSIDERATION OF DIETETICS, INTRODUCTORY LECTURE AT
THE NORTHWESTERN COLLEGE OF DENTAL SURGERY, CHICAGO.

BY ALBERT HARRIS HOY, M. D., CHICAGO, ILL., PROF OF "DISEASES OF THE
ALIMENTARY TRACT."

REPORTED BY JOHN DAVERN.

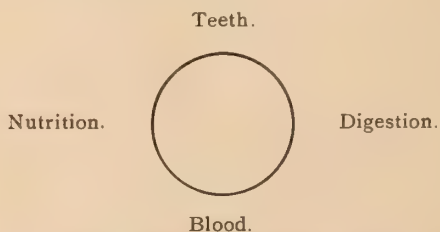
The addition of a course of instruction on diseases of the alimentary tract to the curriculum of dental colleges has lately been made by some of the eastern institutions and is in keeping with the progressive spirit of the age, which may best be expressed by saying that there should be no specialism in knowledge, though there may be a special application of that knowledge. It is an axiom among men that to be a successful specialist in any branch of medicine the specialist should serve first a term of years as a

* See page 49

general practitioner. This is said because all recognize the fact that none of the organs of the body can be said to live alone. The function and condition of each depend, in a marked degree, on that of all the others.

In order then to estimate the importance of reflex disturbances and the general influence of nutrition on any organ or tissue, it is necessary to have a most comprehensive knowledge of the body both in health and disease. There are, in the practice of the healing art, specialists devoting all their time and skill to the eye, the ear, the throat, the nose, or to gynæcological work, or to the nervous system or to the correcting of deformities, or to the organs of digestion or excretion, and the dental surgeon of the future will, no doubt, embrace in his work all operations done in the mouth as well as the correcting, preserving and restoring of the teeth.

We have referred to the various specialists but as we note their success we find it bears a ratio to the broadness and comprehensiveness of their knowledge of all the organs. That the dental surgeon should, in addition to his knowledge of anatomy, surgery, histology, embryology pathology, materia medica, therapeutics, chemistry, bacteriology and physiology, have as well a general idea of the diseases of the alimentary tract, needs perhaps no demonstration. We have only to remember that the teeth play an important part in digestion and that the general nutrition must of necessity influence the proper development of the teeth, to concede the importance of this topic. To put the matter as a demonstration we may use the following diagram :



This may be read thus: good teeth, good digestion, good blood, good nutrition, good teeth, or conversely bad teeth, bad digestion, bad blood, bad nutrition, bad teeth.

The dental surgeon must positively be able to recognize certain constitutional diseases as manifested by certain appearances or disorders of the mouth, throat or tongue. This is a necessary

knowledge to him because some of these disorders are infectious or communicable and there is danger of infection being carried from one patient to the other, unless the dental surgeon fully recognizes the nature of the disorder. So in looking after the teeth of children, from certain conditions he should be able to detect digestive disturbances which it is important, not only for the teeth but for the present and future health of the child, should be at once corrected.

It is certainly in the province of the dental surgeon to be able to recommend a suitable diet for his cases of defective nutrition or if this is not all that is necessary, he can advise that the patient be put under the care of a physician for the necessary treatment.

A general knowledge of the disorders of the alimentary tract is then of twofold utility to the dental surgeon, for it enables him to achieve better results in his special work, and also to detect early evidences of constitutional disorder, and by suggesting the necessity of medical treatment for this, his services become of twofold value to his patient.

As in the diagram just given, we include digestion, blood and nutrition, the consideration of our topic must naturally begin with a study of food and water and some general remarks are first in order.

The importance of diet to health and well being has long been recognized, and writers from the days of the early philosophers to the present time, have dwelt upon it. Unfortunately, however, during all these years no one has achieved an accurate statement of what constitutes wholesome diet. Hippocrates said, "It appears to me necessary for every physician to be skilled in nature and strive to know, if he would wish to perform his duties, what man is in relation to the articles of food and drink, and to his other occupations, and what are the effects of each of them to every one."

The saying that, "One man's food is another man's poison," is but the expression of the impossibility of fixing a rigid dietary for civilized man, in his present condition, but it should be possible to determine what elements, in food and drink, are likely to be injurious to some individuals or to all.

It is apparent, that to just the extent that man eats and drinks what nature has adapted for his use and equipped him to make use of, just to that degree is he free from digestive disorders and diseases resulting from malnutrition. This is exemplified in the

splendid physique of the native tribes of various lands. On the other hand civilized man suffers so much from digestive disorders, induced by dietetic errors, that large books are devoted to the especial consideration thereof. The subject of dietetics covers a wide field and a review of some points which must be borne in mind, in connection with it, is necessary before proceeding further.

Animal life is broadly divided, according to the kind of food the different varieties subsist on, into the carnivorous, the herbivorous and the omnivorous classes. On examining pieces of the red flesh from animals living on different varieties of food, the composition and structure are found to be the same, and give no indication of the food on which the animal has sustained life. But an examination of the excretion from the kidneys will indicate at once the food of the animal furnishing the excretion. Proper excretion of waste products by the kidneys, depending then on the food taken, it follows that it is necessary to health that each variety of animal should have its natural food. Animals are guided by instinct in the selection of proper food, and hunger is the sensation which impels them to seek it.

In the most highly civilized condition of man we find that, though without instinct to guide him, he has not availed himself of his higher power of reason, but has permitted appetite and the pleasures of the palate to govern him in eating and drinking. Want of knowledge as to what constituted the proper form and combination of food and drink, is possibly the source of this grave error. Appetite is largely the result of habit, and no doubt, of hereditary influences. It is admitted that digestive disorders are certainly hereditary, and many persons, therefore, are suffering from the dietetic errors of their forefathers. Hence healthful fitness in eating and drinking is one of the most important factors in the problem of preventing the deterioration of our race. We have then a duty in this matter, in that we so regulate our diet as not to leave dyspepsia as a legacy to our children.

Man is assigned to the class of omnivorous animals because able to live on either animal or vegetable food, or on a mixture of both. But man, unlike the animals, who drink only water, is omnivorous in drinking as well as in eating, and here arises a condition which we may say nature never intended. Whatever form of food different animals may be impelled to eat to satisfy hunger, water is the only drink they take to slack thirst. Concerning an ani-

mal, then, it is only necessary to say what its natural food should be, but in the case of civilized man, we must add to the consideration of the question of eating the consideration of that of drinking also.

Inasmuch as man lives under so many different conditions, and the energy he is called on to expend varies so greatly in degree and kind, it is necessary that these different factors be taken into account in deciding what his system requires for its proper nourishment. The question of eating and drinking, then, instead of being a general one, becomes an individual one. That this is true is evident from the idiosyncrasies and hereditary influences constantly observed. Books on dietetics, however, are not founded on this truth, but specially that man should take just so many ounces of proteid, so many ounces of fat and so much starch. With healthy men performing the same amount of work this might be practicable, but in no other conditions. The failure of any rule like this is inevitable. It only reflects the chemistry of digestion as worked out in the laboratory, and though the information thereby gained is very valuable and constitutes an important aid in applying general principles, it is not the equivalent of life sustaining digestion. The true test of a food is not alone its digestibility, but its adaption to the capacity of the individual using it to not only digest, but to assimilate, and also to excrete properly the waste matter formed from it. These points can only be determined in detail by studying the needs of the system of the individual, taking into account at the same time the condition of the digesting, the assimilating and the excreting organs. That digestion, assimilation and excretion all belong to the subject of dietetics is now apparent, and the want of accurate knowledge on the subject is painfully manifested, for we find dietetic directions generally given as follows: "Take easily digested food," "Eat light diet," "Eat what your stomach craves," "Avoid rich food," etc., etc. The folly of such vague generalities is plain. The subject should be treated by determining the exact effect of each single element or principle in food and drink upon the blood and excretion in various conditions, in health and disease. If years of observation and study and but a single fact to the sum of knowledge on this topic the time will have been well spent.

It ought to be possible to formulate a dietary as accurate, as to its substances and combinations, as a medical formula, and

there is no reason why accuracy and exact knowledge should be required in the latter more than in the former. In fact, food and water are the blood makers, and drugs are not, hence it is but reasonable to affirm that proper diet must both precede and attend medication.

A faulty excretion by the kidney is now admitted to indicate the ingestion of an improper kind or quantity of food or drink, some derangement of digestion or assimilation, or the poisoning of the system by toxic principles, which may originate in the contents of the alimentary tract from putrefaction, or chemical changes taking place there, or which, on the other hand, may be generated in the animal tissues themselves.

In short, by an analysis of the urine, knowledge is gained which is valuable in the treatment of disease of all kinds, and what is of far more importance, it is possible to be forewarned by the knowledge acquired, so that a diseased condition may be prevented. That the blood and excretions are affected by different forms of food has long been admitted. The study of the secretions and excretions, as throwing light on pathological and abnormal conditions in the body, is conceded to be the proper method by which to attain to the accurate knowledge as to the needs for nutrition and of the kind required. More than this, it will also indicate if the food be in proper quantity and is being thoroughly utilized in generating heat and motion in the animal body. As a matter of fact urine is the ashes from the animal furnace. It is the only true excretion from the body. The engine fireman determines by the ashes from his grate whether he is using the proper fuel, if it is the best he knows of its kind, is economically and properly consumed, and is giving the best results possible. And so we should be able to determine by the ashes (the urine) from the human furnace, its proper fuel (that is food), and the amount adapted to the needs, the work and the conditions (as to health or disease) of each individual.

One of the first effects of various articles of food and drink, is found to be a change in the alkalinity of the blood, and our future discussion of our topic will give particular attention to this point, affording as it does a guide to proper food and drink or medication in all forms of disease. It is an accurate guide when the question of accuracy or inaccuracy may determine the issue of life or death.

Dr. J. B. Haycroft, who made an exhaustive study of the

alkalinity of the blood says : " The reaction of the blood in different conditions may vary as widely as that of the urine." I wish to confirm this view entirely and as the result of my own investigations to say that the varying reactions of the urine, show those of the blood, and they afford an easy and accurate means of determining its condition.

Now the different acids taken in food and drink stand at the head of the list as tending to reduce the alkalinity of the blood, as shown by a series of tests and experiments I have made on the secretions and excretions. How little is known of the exact effect of acid on the animal economy would surprise any one not familiar with the literature of the subject, and much of that which is stated in books will be found to be erroneous. The general statement, so often made, that vegetable acids are converted into alkaline carbonates and so excreted by the kidneys, is far from covering the whole ground.

With a view of determining just what is the action of acid on the animal economy, we shall take up the subject under the following heads : The effect of acid in digestion. The effect of acid on the blood. Food and drink with reference to the alkalinity of the blood.

A DEFECT IN THE PLATINUM PINS USED IN MINERAL TEETH.

BY W. BOOTH PEARSALL, F. R. C. S. I., DUBLIN, IRELAND.

Twelve years ago I made an upper gold denture, for an old lady, who had been a patient of mine for some years. My patient had always treated me with the greatest confidence and good will, and I looked upon her as one of my best friends, so far as my professional skill was appreciated and used by her. This denture was designed to carry plate or flat-backed teeth in the canine and incisor region, together with some tube teeth, bicuspid and molars; to fill the places of those she had lost from time to time, from gouty inflammation of the socket. The plate teeth were backed with gold, fitted and ground, I hope accurately and well. They were positioned in the mouth and on removal were invested in plaster and pumice, the wax attachments removed, the solder placed in position, the case heated to redness, and carefully soldered. The case was polished and fitted in the mouth and there was nothing remarkable about the appearance of the teeth.

All went well for a couple of weeks, when a central incisor "dropped off." The teeth were somewhat dark in color, and not easy to get. The shade was about No. 17 of S. S. White's manufacture. I was fortunate enough to have some extra sets that exactly matched, and a new central incisor was replaced, in lieu of the one that dropped off. Two days later my kind old friend returned with the central incisors I had replaced, together with the left lateral free from the backings. They were replaced with new teeth from the duplicate sets, and the other teeth were apparently intact and beyond any suspicion of unsoundness. In three days the patient returned with three teeth off, including the central and lateral which had been replaced. To make a long story short I backed, fitted and replaced three sets of teeth before the "dropping off" ceased to trouble my patient and myself.

To any dentist who takes pains with such work, and who has laboriously acquired practical skill and experience, such a series of mishaps must be mortifying; skill and time are spent without any satisfactory result to the dentist, and with a rapid deterioration of the stock of confidence the patient has slowly acquired during the visits to the practitioner spread over many years. I think I can claim a good sound knowledge of the practical details of most dental mechanical work as pictured in dentures, but I confess I was completely at a loss to account for these series of mishaps. Close examination of the backs of these teeth, showed even with the naked eye, an unusual crystalline fracture of the platinum pins, quite unlike the fibrous break we are accustomed to notice in soft platinum, which have been deliberately broken across. I had purchased the teeth from a dealer I had been obtaining supplies from for years, and they were made by a manufacturing firm of world-wide reputation. Inquiry elicited the fact that the annual amount of platinum in the market is limited in quantity, and it is one of the few products of nature that can be "cornered" by rich and unscrupulous men. There has been for a long time past an increased demand upon the visible supply of platinum on the part of electricians, and some dishonest person or persons succeeded in placing in the market, a stock of platinum wire alloyed with zinc, which was not discovered till great practical inconvenience had been inflicted upon numbers of honest people.

I do not for one moment imagine that any tooth manufacturer would deliberately use unreliable material in such a metal as plati-

num in the form of pins. It does so happen, however, that brittle platinum wire gets into our hands in the mineral teeth placed at our disposal for professional use. Although this defect has been indelibly impressed on my mind, I had not, strange to say, come in contact with any one who had met with a similar experience.

A few weeks ago Mr. George M. P. Murray, F. R. C. S. I., sent me in some teeth and asked my opinion as to the cause of the disaster. They had "dropped off" a gold plate which had been carefully made, having remained in a tumbler of water over night. Close examination showed the same crystalline fracture, as in the pins of the teeth that had vexed me so much. I find that Mr. Murray's experience is the same as mine, the teeth "dropping off" as spontaneously and fortuitously as if Sir Isaac Newton himself was waiting for a further example of the law of gravitation. I have made a small collection of teeth in which similar "droppings off" have occurred. Mr. Murray has also supplied me with a vulcanite molar of English manufacture and which has not been "fired" or soldered or subjected to any severe tensile strain, yet come off, with the cause for its "dropping off" unexplainable from ordinary causes. This tooth shows also a very crystalline condition of the platinum pins. I have also a case of fracture in the pin of a continuous gum molar, one of my own stock which broke when I was firmly pushing it into the wax card to which it belonged, in summer weather. The crystalline fracture is well marked. Such a defect in platinum pins has caused me inconvenience, and serious annoyance in four cases. The first was that of the patient I mentioned at the beginning of this little paper whose good will and confidence I feel proud to think I still retain, after an experience warranted to break a less tempered band of union. The second was that of a patient with an edentulous jaw wearing an upper gold denture, all the plate teeth of which "dropped off" without the least provocation. These teeth were duly replaced, but the patient considered I had been careless of her interests, and carried her good will and her fees to another practitioner. We had some correspondence on the matter, but her conviction remained unshaken that I had been dishonest in that I used teeth of unreliable and inferior manufacture for her case. The third and fourth cases were simply the "dropping off" of an individual tooth, the pins of which were I found very crystalline. I suppose now that I draw attention to this very grave defect in

the platinum pins of mineral teeth, other practitioners will place their experiences on record, but until I received Mr. Murray's specimens asking for an explanation of this defect, I had never learned how very mortifying such a technical defect can be to an honest practitioner. I am sorry I cannot suggest any remedy. We can demand from the manufactures of unreliable goods a new tooth for a defective one, and some compensation for loss for credit in practice as well as loss of time. Were I a manufacturer I would rigorously test all the platinum used for pins, and if a sample of this adulterated platinum should come under notice promptly return it to the dealer. The neck drum of the vulcanite tooth pins, and that of the continuous gum tooth show conclusively that this defect is not specially due to *soldering*, the so-called "overheating" of the manufacturers when complaints are made. I have watched the soldering of plate teeth for years. I have soldered hundreds of them myself but I have never noticed such defects before and these brittle platinum pins prevail in American manufactured teeth as well as in English ones.

CATAPHORESIS AND ELECTROLYSIS IN DENTISTRY.*

By THOS. B. HARTZELL, M. D., D. D. S., MINNEAPOLIS., MINN.

I believe the possibilities of electricity in dentistry and medicine are practically unlimited.

With my friend, Dr. E. B. Weeks, I saw in the building where I live most of the hours of the working day, an apparatus constructed by an acquaintance of mine. He had so placed a Crooke's tube that it received the current generated by some powerful batteries at hand. The current, in passing through the Crooke's tube, which, by the way, is a vacuum chamber of glass, leaping from one electrode to another, gives forth a very powerful and curious light; it seemed to be a beautiful hue of green. I was given a fluoroscope. The fluoroscope is simply a paper box made to fit up about the eyes, lined with black paper to exclude all light and to darken it. I placed the fluoroscope before my eyes, placed my hand before the fluoroscope, and was enabled to see the bones of my own hand as distinctly as one can see one's own face

*Read before the Minnesota State Dental Association.

reflected in a mirror. The bones of the foot can just as plainly be observed, without the formality of removing the shoe.

I simply mention this incident, because it in a measure illustrates how unlimited the various applications of electricity may be.

So when we consider cataphoresis, I think we are talking about something very practical. In medicine, cataphoresis was used in 1858, by Richardson, who called down a storm of criticism upon himself. He was, however, able to perform an amputation without the evidence of pain. It was dropped, and has been brought to light again at different times, only to relapse into oblivion. But now, through the instrumentality of Dr. Morton, it has come to stay. There are a few underlying principles I would like to bring to your notice, that will serve to make the use of it more encouraging to those of you who will doubtless soon commence experimentation with this new agency.

The current must be applied so lightly at first that the patient will be unconscious of its flow, gradually raising the amperage as the tooth becomes anæsthetized. The current alone causes pain, so at first use a small amount until you gain partial anæsthesia, after which you can increase the current very rapidly. The cocaine carried into the pulp is in a direct ratio to the amount of current used. I am using the 110 volt current, with a rheostat that enables me to so control the current that I can reduce the amperage to one-twentieth of a milliamperage, or can use the whole electro-motive force of 110 volts, which would furnish a larger amperage than is necessary. Building and street currents are objectionable because of their unevenness.

The most important thing in the use of electricity for this purpose is to be able to increase and decrease the current evenly.

I have entirely failed to get anæsthesia in those cases where the pulp is congested, because the current increases the congestion sufficiently to pinch the nerve fibril in the pulp, causing pain, and the patients will not bear the current long enough to gain anæsthesia. Then, too, experience teaches that cocaine does not anæsthetize congested tissues very thoroughly.

There are some dangers in the use of cataphoresis; one is overanæsthetization, when the operator is in danger of approaching too near the pulp, perhaps placing a metal filling too close to the pulp, causing its subsequent death.

Another point to be borne in mind is the electrolytic action of the current. The current tends to decompose tissues through which it passes. Oxygen and acids gather in the vicinity of the positive, and alkalies and hydrogen in the vicinity of the negative pole, so that the current too long continued could cause death of the pulp. This fact is taken advantage of in the removal of superfluous hairs; the tissues furnishing blood to the hair are devitalized, so that when the hair is epilated it does not grow again.

I have had one case where the patient complained for several days of a cold, numb feeling in the tooth operated upon. Too much cocaine was used. One other objection is the time consumed in gaining anæsthesia. From eight to twenty minutes of valuable time is consumed on an average.

The therapeutic value of electricity has been generally recognized in medicine, but its value in dentistry is not yet proven, though I have had results that lead me to believe it is to be one of our valuable therapeutic agents, through both its cataphoretic and electrolytic action.

Cataphoresis implies, not only the power to convey medicinal substances in solution into the tissues, to gain their remedial action, but also the movement of fluids already in the tissue. The fluids in the tissues are repelled by the positive and attracted by the negative pole, thus making it possible to transfer fluids in the tissues from one point in the body to another, which fact is taken advantage of to deplete congested areas, and the operator can at the same time instil into such areas medicinal agents. This action of the current has been most successfully used by gynecologists in uterine, and particularly ovarian congestions.

Anodal electrolysis is a name used to designate the phenomena which occur in tissues of the body nearest the positive electrode, when a direct current is applied, and these are the accumulation of oxygen, acids and chlorine in the vicinity of the electrode. This fact can always be used to determine which pole is negative and which is positive, which fact is important to know. Moisten a bit of blue litmus paper, place it upon the two electrodes in such a manner as to form part of the circuit. Over the positive pole the paper will be changed to red, thus giving the ordinary acid reaction to blue litmus. The tissues near the electrode are disintegrated to a greater or less extent. The acids formed act as a styptic, coagulating the albuminoid constituents,

and cataphoresis further aids the styptic action by repelling the fluids in the tissues, tending to desiccate the area.

In anodal electrolysis, if the electrode is in itself easily oxydized, or has affinity for the acids produced, secondary chemical compounds are formed which have the therapeutic value, as, for example, oxides or chlorides of iron, copper and zinc, and these will be instilled into the tissues, as fast as they are formed, by cataphoresis.

In the past, anodal electrolysis has been used in the treatment of capillary varix (mother's marks), abnormal dilation of the blood vessels, where the knife cannot be used, in such locations as the nares, pharynx, pelvic organs, etc., also for the removal of moles, warts, hairs and fungoid growths.

The current has proven valuable for the destruction of those low forms of animal and vegetable life which cause some of the parasitic and bacterial disorders, as in lupus vulgaris, gonorrhœa, etc.

Metallic electrolysis is the function of the anode almost exclusively, because no metal is acted upon by the alkalies formed by the cathode, except aluminum, and the aluminates of sodium and potassium are of no especial value. The anode is the active electrode in anodal electrolysis, but both can be employed actively at the same time if so desired.

When a current passes through the solutions which form the greater part of all animal tissues, the constituents near the cathode are decomposed. Hydrogen, and soda, and potassium gather in the vicinity. This tends to liquefy the tissue, and for this reason has been largely used of late in the treatment of scar tissue. Bands of scar tissue, the result of burns and wounds, yielding to this treatment, especially those about the face, neck, joints, œsophagus, urethra, uterus, and in the removal of fibrous growths and superfluous hair, exostosis, etc. Cathodal electrolysis has proven very useful because of softening, liquefying action brought about by the action of the alkalies formed in the tissues wherever the cathode is placed. In dentistry both the cataphoretic and electrolytic action of the current may be used in the treatment of pulpless teeth and with profit. I hope those interested will give this line of treatment attention and report their experience.

ROENTGEN X RAY FINDS A MISSING TOOTH.

By B. H. CATCHING, D. D. S., ATLANTA, GA. EDITOR CATCHING'S COMPENDIUM
PRACTICAL DENTISTRY.

Miss. G. R., age about nineteen years, called for consultation about a loose left superior central incisor. Her front teeth were beautiful specimens of dental structure. The left superior central was very loose, moving as a temporary tooth about to be displaced. Reflected light showed opacity. No blow or accident of any kind had occurred to the tooth. The pulp canal was entered without pain, hæmorrhage rather profuse. A probe revealed an obstruction about one-third up the length of the root. In passing the instrument back and forth it would glide to the right or left of the obstruction for a short distance. A malposed tooth making its way down and causing the absorption of the central root was



suspected; an examination of the arch revealed missing the left cuspid. The patient was dismissed, and arrangements made at the writer's residence for a Roentgen X ray examination. With the ten-inch spark induction coil of F. P. Catching B. S. and a Thompson double focus ten-inch tube, with one minute exposure, a wonderfully clear radiograph was obtained, showing the cuspid as diagnosed, and doing the damage. The DENTAL REVIEW gives a beautiful reproduction of the picture.

As some reader may wish to use this means of making a diagnosis of a dental lesion, a few words about the methods used in this case may prove beneficial.

For good Roentgen ray results a long sparking machine is desirable. A short spark and smaller tube may be used, but the results will not be so good, and the time of exposure will have to be prolonged, if about the mouth, very tiresome to the patient. The machine used in this case was a ten-inch spark induction

coil and one of Thompson's best ten-inch spark tubes. One minute was the time of exposure.

The ray tube was fixed by adjustable arms to the upright of a student lamp. The patient lay sidewise on a lounge with the unaffected side down. The tube was placed in front of her face, about six inches away, with the focus looking from about the end of the nose down through the lip and alveolar process. A cabinet size photograph plate had been cut crosswise into strips about one inch wide, and each piece wrapped in black paper. This was done by the writer's neighbor, Mr. C. W. Motes, in his dark room, and whose help was valuable in preparing the plates and developing them. With the patient and light in position, the current was turned on to assure her there was no danger. The current was turned off, the writer knelt by her side and slipped one of the small covered plates into her mouth in position to catch the rays from the suspected tooth. One minute's exposure gave the desired results, though five small plates were used, and timed differently.

The plates must be kept wrapped in the black paper and not a particle of the X ray light must touch them before they are placed in position. If the paper should become a little wet in the mouth, take the plate to a dark closet, remove the paper and re-wrap with the dry end of the paper over the exposed end. The corners of the plate that passed into the mouth were cut off so as to allow the plate to extend further up in the roof of the mouth.

PYORRHŒA ALVEOLARIS.*

BY A. W. HARLAN, M. D., D. D. S., CHICAGO, ILL.

The subject of pyorrhœa alveolaris has occupied so much of recent dental literature, that it seems unnecessary to recapitulate the views of the various authors who have devoted more or less time to the subject in the past year or two. You are all familiar with the uric acid and gouty diathesis theories of a certain school of pathologists, and also with the views of those who believe in the local origin of this disease. Without entering into a disquisition for or against the constitutional origin of pyorrhœa alveolaris, your essayist this evening would first call to your minds one of the points in favor of the almost exclusively local origin of this affection of the peridental membrane. It has been noted for many years past by other observers, as well as myself, that when a tooth has been extracted from a diseased socket, one that is known as a pus flowing socket, that immediately or very soon thereafter the disease is arrested; that the socket heals, the tissues become firm, and there is no further local evidence that the disease was ever present. If the initial loosening of a tooth or teeth is brought about through the agency of excess of uric acid, why would not this have continued after the extraction of a tooth or of the teeth?

If the uric acid and urea are not decreased to the normal quantity that is secreted daily in an average normal man or woman, there is no reason to suppose but that the tissues adjacent to the sockets would become debilitated, and that the pus flowing pyorrhœa alveolaris would exist in the gum outside of the peridental membrane. Uric acid according to my observation causes a general recession of the gum without the production of pouches or pockets. In no case is pus to be found under the edges of the gum.

As a matter of fact, the pus that is produced around the root of a tooth and between the peridental membrane and the cementum cannot be produced through chemical agencies, or through excess of uric acid in the system, as according to the most recent bacteriologic knowledge on the subject of pus formation there can be no pus produced anywhere within the human body except through the agency of microorganisms. We have numerous examples of the presence of the so-called pyorrhœa alveolaris, not

*Read before the Chicago Dental Society.

only in the mouths of the robust, but in the mouths of those in moderately good health, not exactly in a strict anæmic condition, and we have still further examples of pyorrhœa alveolaris in the weak, the feeble, the debilitated, and the aged.

Now, if the disease of the socket is strictly of constitutional origin, why do we have so many examples of robust, well fed, well exercised, well nourished people presenting undoubted cases of loosening of the teeth, accompanied with the usual serumal concretions on the surfaces of the root, a flow of pus, and all of the concomitant symptoms?

According to our observations, extending now over many years, and having covered a large number of cases—hundreds of cases of true pyorrhœa alveolaris—we have come to this conclusion, that the etiology of pyorrhœa alveolaris, while it may be more or less obscure, has a more reasonable basis for its understanding when the contention is made that it is of hereditary, local, or infectious origin, and that there must have been an injury antecedent to the beginning of the destructive agencies which we always find present around the roots of teeth. It may be in some instances, that this is due to the use of drugs, to the unwise extraction of a single tooth or two teeth, to malfitting of a rubber or other artificial denture; to the mal or badly fitted bands and springs and wires in the regulation of teeth; to the injudicious use of toothpicks; to the use of coarse toothbrushes; to the use of corrosive insoluble dentrifices; to the misuse of wedges between the teeth, or the application of clamps—in short, to anything that would have a tendency or would actually destroy the natural festoon and interproximate gum tissue filling the interproximate space.

In all of the cases that I have examined carefully with fine broaches and probes, I have always discovered that if there was a pocket along the side of the root of a tooth, that there was a minute opening at the gingival margin, and that pockets did not exist on the roots of teeth above the gingival margin, save in a few isolated cases due to trauma, and the pathogenic microorganisms which are always present and ready to produce pus under such conditions would be present there, and these pockets would not be open pockets, but would be more nearly allied to what might be considered to be a false alveolar abscess; that is to say, a pocket without an opening or sinus, and the pocket gradually

growing larger and larger until the integrity of the superimposed tissues was finally destroyed, and there would never be an outlet from the alveolar process and the gum. I have seen a number of cases of this kind. I have seen many cases, specimens of which I will now exhibit, of serumal calculus attached to the sides of the roots of teeth and over the apices of roots.

These specimens of calculus differ entirely from the ordinary salivary calculus which is attached to the necks of teeth, and in some cases to the crowns when they are not much used, or by infrequent brushing, and it is deposited more particularly on the lingual surfaces of the inferior incisors and the buccal surfaces of the superior molars. The difference between the mechanism of its deposition on teeth and the mechanism of the deposition of serumal calculus on the roots of teeth is this: In the one case it is purely chemical and mechanical; that is to say, the chemical throwing down of the carbonates and the inorganic substance which are readily seized by the *leptothrix buccalis* clinging to the neck of the tooth causes the salivary calculi to become firmly attached to the crown and neck of the tooth, displacing the periodontal membrane in a purely mechanical manner. This, without the production of pus and without the assistance of the pathogenic microorganisms. In the other case, the serumal calculus is deposited slowly at or near the point of irritation and infection. We see on the sides of the roots of teeth little granules and islands and spots of smooth, shining, sometimes transparent sheets, even of serumal calculus.

In other cases the granules are more or less roughened, but when it is deposited at or near or over the apex of the root of a tooth, the shape of the root is such that it is more or less globular or rounded and is generally after a time smooth, hard and dense, and it is never white or whitish or grayish, or even grayish brown. It is always brownish black or even nearly black. If this calculus is not deposited directly from the blood we are at a loss to account for its deposition. The known constituents of the blood which would cause this to have its blackish appearance would be iron and sulphur, both of which substances seem to be present by chemical tests in these deposits. If this were a truly constitutional disease, these deposits would be more or less uniform on all the teeth; as a matter of fact, if we see the cases early enough we find that even the soundest tooth, one firmly fixed in its socket, if it has the

initial lesion around the gingival margin, it will be one that will be attacked just as likely as though it were an isolated tooth having little or no support or opposition. If this disease were of truly constitutional origin and dependent upon some constitutional malady, instead of one tooth, or two or three teeth being affected, they would all be affected uniformly. As a matter of fact, we frequently find one, two, or three isolated teeth having no antagonists, that are perfectly sound and in the same mouth we will have one, two or more teeth having all of the symptoms of pyorrhœa alveolaris; that is to say, deposits on the roots, pockets or pouches, pus exuding on pressure and the retraction of the gum which must follow sooner or later. These prefatory remarks with reference to the etiology of pyorrhœa alveolaris are simply introductory to what we have to say in regard to the treatment, and are not to be considered as final and conclusive—merely speculative.

In cases that we have from day to day, and week to week, and month to month, we find that anything that has a tendency to improve the general health, has a tendency to assist us in our local medication. We have administered many antacids and agents calculated to destroy the excess of uric acid in the system and to correct various other constitutional and even functional disorders; but in the number and variety of cases that we have seen and that have been treated locally, the greatest successes have come from the absolute, thorough, conscientious, painstaking, diligent searching for the minute granules, sheets and islands of serumal deposits and removing them mechanically from the sides of the roots and the bifurcations and even over the apices of the roots. In these latter cases, of course, it presupposes that the pulps have died, and it will be found in many such cases that if the deposits reach quite or nearly the apex or the apices of the roots, that it would be a much better practice to destroy the pulps at once rather than to waste time in using local treatment which will only continue the irritation that would eventually result in the loss of the pulp.

After the thorough removal of these deposits and the thorough irrigation of the pockets and pouches and getting rid of foreign matters and the removal of any necrotic tissue, bony or soft, in these pockets, or surrounding them, we have found from numerous experiments with many local agents that the first and initial treatment must be produced through the agency of some powerful

escharotic and astringent sufficiently diluted so that it will not destroy the normal or nearly normal tissue, but will destroy the surface or surfaces of these pouches and pockets, and will destroy the microorganisms present as well as the spores. It is very essential in these cases that such agents as diluted sulphate of copper, trichloracetic acid, diluted sulpho-carbolate of zinc, diluted sulphate of zinc, diluted iodide of zinc be used in consequence of the possession of certain well-known escharotic and astringent properties which many other agents that are escharotics do not possess. For instance, chloride of zinc is a powerful irritant, much more powerful than sulphate of zinc, or the sulpho-carbolate of zinc, trichloracetic acid, sulphate of copper, or iodide of zinc, and it is a more rapid destroyer of tissue, hence it is far better to use an agent or agents such as have been previously mentioned rather than to use those like chloride of zinc, chromic acid, ethylate of sodium, carbolic acid, lactic acid, etc. Mind you, in the introduction of such agents into these pouches and pockets, we must have the pockets thoroughly cleansed, no foreign matter whatever in them. Repeated irrigations of these pouches with diluted boroglycerin, 5 per cent, in warm water, or diluted or saturated solutions of the silico-fluoride of sodium in warm water, about 110° F., or a 5 per cent solution of the new boracic acid H_3BO_4 in water, 110 to 115° F. This is something that is absolutely essential, to thoroughly wash out and sterilize and remove everything that is removable by irrigation, and, if necessary, if the pouch or pouches be deep, an incision should be made through the gums opposite the bottom of the pocket, so that a continuous stream or jet may go through and remove everything. Then it is also ready for the injection of the aforementioned constringers, sulphate of zinc, sulpho-carbolate of zinc, trichloracetic acid, sulphate of copper, or iodide of zinc. In selecting the respective percentages of the iodide of zinc, the solution should not be stronger than 12 per cent. Sulphate of zinc may be from 14 to 16 per cent; sulpho-carbolate of zinc should be between 8 and 10, and the sulphate of copper, between 5 and 7 per cent; trichloracetic from 5 to 7 per cent. These dilutions of the drugs mentioned from many experiments are more nearly correct than any previous tabulations that I have made on the subject. It is essential that these pouches and pockets be thoroughly injected by the use of a syringe of course, and preferably a platinum or gold

pointed syringe, and if any of the teeth are found loose and vibrating back and forth in the effort of mastication, or if the patient is likely to be feeling of them with his fingers or rubbing them, it is better to ligate such teeth with silver wire, made from pure silver, 67 parts, and pure gold, 33 parts. This can be drawn down to the size of ordinary silver suture wire, a specimen of which I will pass around, and by first annealing it to a red heat, and then weaving figure of 8 loops around the teeth, doubling it if necessary, to insure stability, will prevent the patient from misusing these teeth, because if he tries to finger them he will move all of them if he uses sufficient force, instead of one or two. This will be an aid also in holding the teeth in position during mastication. Now, a certain amount of oxidation takes place in silver which will turn this wire more or less black, in some mouths not very black, but that is an advantage because we have found from numerous experiments that nitrate of silver is a useful agent in cases of this kind in combination with very warm water, and we get the continuous presence of oxide of silver; and it has been found from experiments that have been made in the Johns Hopkins University in Baltimore that the pathogenic micro-organisms cannot be cultivated on a silver plate, hence we have every reason to suppose that the pathogenic bacteria which are always present and always ready to set up a disturbance around the injured gingival margin of the teeth will be deterred from so doing by the presence of the silver. So we have a therapeutic agent in silver wire, and we have strength by adding gold, and that amount of gold in the wire prevents its corrosion, or we get all of the benefit of the gold wire with the therapeutic effect of the silver. These pockets must be looked after carefully, and it is unnecessary for me to give you any directions with reference to the various antiseptic washes and lotions and so forth that should be used in the mouth, except in so far as this: if you have no choice, direct your patient to take one-half ounce of boracic acid and drop this into a quart bottle; fill the quart bottle with water; take half an ounce of silico-fluoride of sodium and place in another quart bottle and fill this with water. Now, when the water has dissolved as much of each of these drugs as will dissolve, have the patient take equal parts of these two solutions, say two teaspoonfuls of each, and add an equal quantity of very hot water so as to still further dilute these solutions from their saturated solutions, and use that as a wash two or three times daily. If the necks of the

teeth are very sensitive from the use of local medication, in addition to this, after the mouth has been thoroughly cleansed, I direct the use of pure carbonate of magnesia, taken into the mouth, nibbling a little of it from the block, a specimen of which I show you. In case the patient does not desire to use the carbonate of magnesia in that way, he or she, as the case may be, can use Phillips' milk of magnesia, which is more expensive however and not any more effective. These pockets must be irrigated and reinjected as often as every third day, and as soon as the pus formation has been stopped through these injections, the continuance of the treatment may be summed up by using the following: If we take 5 grains of resorcin, a specimen of which I exhibit, and 5 grains of alumnol, which I also pass around, add 2 minims of the oil of wintergreen (or any other oil that you may prefer), to the above, then add hot water (by hot water I mean about 110° F., so as to fill the beaker to the 110 minim line), this will give you a little more than a 5 per cent solution of each of the drugs mentioned with the corrective added; that is to say, the oil. You can use oil of wintergreen, eugenol, cajeput, or any agreeable oil which the patient may like. This should be injected into the pockets for the purpose of stimulating and constricting tissues, so that they will come closely in contact with the roots of the teeth and prevent the further invasion of microorganisms, and this must be done religiously, and faithfully and patiently every second or third day for three or four weeks, following the cessation of the first outlined treatment which I have given in this paper. If at any time the teeth do not occlude well, the faulty occlusion should be corrected by grinding or cutting or filing, so there will be uniform pressure all around. If the wires should become corroded and it should become necessary to hold the teeth in position, instead of using a gold band or platinum band, make a band of silver alloyed with gold up to 30 per cent. This may be thin and narrow and may be cemented to the teeth; but if there is any probability of the teeth becoming firm within two months or three months from the time of the beginning of treatment, the reapplication of the silver wire once or twice during the treatment will be all that is necessary. During this course of treatment all dentifrices used should be free from soap or glycerine. The operator who wishes success must be careful to not infect sound gingival margins by using syringes or scalers not thoroughly sterilized. Infection is easy but disinfection is difficult and tedious in the soft tissues.

PROCEEDINGS OF SOCIETIES.

THE CHICAGO DENTAL SOCIETY.

NOVEMBER MEETING.

A paper on "*Pyorrhœa Alveolaris*" was read by Dr. A. W. Harlan, which elicited the following

DISCUSSION.

Dr. F. H. GARDINER, who was to have opened the discussion on the paper, stated that Dr. Younger, of San Francisco, was present, and requested him to speak in his place.

Dr. YOUNGER: I have been very much pleased with the paper of Dr. Harlan. I find that as far as the theory of *pyorrhœa* is concerned, as also in the necessity for the absolute removal of every particle of tartar, we are entirely en rapport. In regard to this treatment—if that cures *pyorrhœa*, it just shows that there are more ways than one of killing a cat. But the plan that I have suggested to the profession, and the one that I have been following with so much success, is a very much simpler one than the method recommended in this paper, which involves the use of a great lot of drugs and waste of time. I do not know why the human mind, that is the professional mind, is so prone to prefer what is cumbersome, and an around about way to cure a disease that has, like in *pyorrhœa*, a simple, straight way of accomplishment. But almost anything will cure *pyorrhœa* after the tartar is removed. In fact, when the tartar is removed your *pyorrhœa* is cured. The only other thing to be done is to produce an adhesion between the walls of the pocket and the tooth substance. Now, in the treatment as given by Dr. Harlan, he asserts that by the use of these medicines and procedures the gum tissue will contract about the tooth and in that way prevent the incursion of any foreign product, and so the recurrence of the disease. It will no doubt for a while do so, so long as the contraction of the gum is kept up; but remember when the pocket heals it is lined with a mucous surface. Now a mucous surface is an excretory surface, and in the course of time the excretions from that become an accumulation of filth and causes in itself a relaxation of the tissues and a reproduction of the disease. The only way then to avoid such recurrence and immune the parts is to produce a perfect adhesion between the walls of the socket and the root of the tooth. So far in my treatment I find that lactic acid is the only agent

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that will bring about this result. When I first commenced using lactic acid in the treatment of pyorrhœa it was for the purpose of applying its lime dissolving property to the pyorrhœal calculus. I went on experimenting with it, and after a time, finding from test made outside of the mouth that its action on tartar was insignificant, I abandoned it. Afterward I discovered cases of long standing that I had treated with lactic acid that were in proper condition with the walls adhering to the teeth. Then the truth came to my mind that the lactic acid causes, by the irritation it sets up, a denudation or desquamation of the mucous surface of the pocket, followed by a contraction of its walls and an adhesive inflammation, by which the soft tissues became firmly adherent to the hard substance of the root. But it acts not only on the soft tissues. It has a cleansing effect on the cementum, and stimulates the proliferation of connective tissue from the endosteal lining of the cementum and osteoblasts from the alveolar edge. In this manner the same intimate relationship is established between the dental and alveolar tissues that existed before the formation of tartar caused their separation. Of course, you must guard the external gums, mouth and lips from the action of the acid. I used to bathe these parts with glycerine for this purpose, but this agent sometimes produces severe pain on sensitive surfaces of teeth. I have found a new preparation by McKesson & Robbins, called oleo-stearate of zinc, that is exceedingly grateful to the mucous membrane and coats the teeth so as to protect any sensitive points they may have exposed. Then you can use the acid with perfect impunity.

Now, opening through the alveolar structure to reach the apices of the roots, should be very rarely done—only when it is impossible to otherwise reach them to successfully remove the tartar. When you find you cannot thoroughly remove the tartar with your instruments by going down along the walls of the root, then it is excusable to bore through the gum and process and cleanse your root or cut it out, as the case may be. I have for two or three patients cut off the apices of the roots and so hastened cure. But it is something that I very rarely do and I would not advise it except where it is absolutely necessary. After you have used your lactic acid, you must remember you have performed a surgical operation. You take a bad case of pyorrhœa, in a molar for instance, and you find you have a raw surface, perhaps half

an inch wide by about an inch or an inch and a quarter in length. You do not think of it because you do not see it, but it is there surrounding a tooth just the same. That raw surface has to be protected from infection the same as you would a denudation or a cut in any other part; even more so, for the mouth is such a hot-bed for pathogenic bacteria. For this reason I am glad Dr. Harlan includes this post-germicide treatment in his practice. But he does not use it often enough to keep the wound thoroughly immune. Antiseptics should be used every hour or two so as to keep the mouth in a perfect state of asepsis until a perfect union can be established between the gum tissue and the root of the tooth. As a rule, I calculate that one application of the acid is enough, but sometimes when the tissues of the pocket have not established perfect union, we have to apply it again. But always wait for one week before making an examination, because if you do so sooner, the attachments are so feeble that you are apt to tear them open and undo your work.

Dr. MAWHINNEY: I just want to ask Dr. Harlan and Dr. Younger the question as to whether they, in instrumentation, preserve the margin of the gum, that is, do they always preserve the margin intact within itself, or do they sometimes find it necessary to divide the margin? If so, what is the result? Or if they ever enter through the gum high up to get at the apex, I meant through the gum itself, not going between the gum and the root of the tooth, but through the gum and the alveolus, if there be alveolus present. I just asked for information.

Dr. YOUNGER: As Dr. Harlan requests me, I will answer the question. The margin of the gum never should be cut. You should never wound the gum any more than is absolutely necessary. You can, as Dr. Harlan says, pass through the alveolus to the diseased root when you cannot get your tartar off in any other way.

Dr. CLIFFORD: I would like to have these gentlemen having this success in the treatment of this disease tell us if it is a permanent cure, or if it is probable that there will be a recurrence?

Dr. YOUNGER: I will tell you the remark made by a gentleman to a lady patient of mine that I am now finishing, that will answer the question. She had one of the very worst cases of pyorrhœa that I have ever seen. The gums were very much retracted and the teeth moving every-which-way. She had paid me a great

deal of money and her teeth were not yet firm—because sufficient time had not elapsed—and they were bound to retaining bands with a multitude of ligatures, to keep them steady. While summering last August in Mackinac she met this gentleman from Grand Rapids, Michigan. To him she confided her misgivings, and that after paying so much money it would probably not do her any good. He found out who had treated her, and said: “Do not worry about your teeth. I was in California ten years ago and I went to Dr. Younger. I tell you, that my teeth were so loose, that when I went to bed at night I did not know whether I would find them in my mouth in the morning, and he treated them, and he also implanted three teeth. That was ten years ago and to-day they are every one as firm as they ever were, so don’t worry about the teeth, they’ll be all right. It is the pocketbook that you are to worry about.”

In regard to wires. It would be a Godsend if wires could be so made as to be used and take the place of ligatures, but you cannot make a knot with wire nor stretch it without breaking it, and then the little points are jutting out and sticking into the gum, or the cheeks, or the tongue; neither will it remain in position on the teeth. If you draw the wire tight so it holds the teeth comparatively firm, it will break in making the fastening. I have tried every kind of wire; I have had them so thin you could hardly see them, hoping to get something that would not retain secretions, but I find after all there is nothing like the silk ligatures that I have familiarized so many of you with.

A MEMBER: I would like to ask Dr. Younger if he diluted the acid, or used it in full strength?

Dr. YOUNGER: In full strength.

The president then called upon Dr. Lawrence, of Lincoln, who spoke as follows:

Dr. LAWRENCE: This is an unexpected pleasure and one that a country cousin does not often enjoy, of meeting with the Chicago Dental Society. There is no man living any better qualified to present a subject on etiological treatment and on their surroundings, than Prof. Harlan, and I have no criticisms to make with regard to his medicines, because he has had long experience. I would simply notice this matter so far as my own observation and experience goes, and testify that if you make a clean surgical operation of the work before and after, and with proper care upon

the part of the patients, you will cure the majority of the cases of pyorrhœa presented to you. If your surgical work is not perfectly done, I do not care what your medication is, you may inject it till doomsday and you will not get the results desired. Of course all these medicines have their place and they do a good work, but in my opinion pyorrhœa needs surgical treatment and protective treatment before and after, and you will, as I say, in a majority of cases have a cure. Of course at times the occlusion must be perfect, because the parts must have a rest that nature might do her work, and if you do this thoroughly then a healthy union will take place between the soft tissues and the hard tissues. Of course I have had comparatively little experience. I have had a great deal to do in the line of cases taught by Dr. Younger, and in the majority of cases, after four months, I have seen quite a number of them, the adhesion is perfect, there is no pus, and the patient is comfortable, and I do think the profession, as well as humanity, are under great obligations to Dr. Younger for the treatment he presents to you.

Dr. HASKELL: Although not practicing operative dentistry, I have always been interested in whatever pertains to it. I read much that is written upon the subject of operative work, and especially upon the subject under discussion this evening. More than thirty years ago I became acquainted with Dr. Riggs, who gave the name to the disease originally. Having seen a great deal of it and much of its treatment, I have known of but very little success, and was so thoroughly convinced until within the last two years that it was impossible to cure severe cases of pyorrhœa, had given up all hopes of there being any cure, that is in its worst form.

A year ago last June, being in San Francisco, I called upon Dr. Younger; had met him but once at the world's congress, and had some prejudice against him in consequence of what I heard of his implantations. When I entered his reception room there was a lady waiting. After Dr. Younger had met me he took this lady into his operating room. Shortly after, he called me and said "I want you to see a case which I treated six years ago." The lady six years previous had called upon a dentist for consultation with regard to three upper molars, two right and one left, which were so loose the dentist said they could not be saved; could pick them out with his fingers; they had better be extracted and have a plate. She

said "I have heard of Dr. Younger treating such cases successfully and will see him first." He said, "Madam, neither Dr. Younger nor God Almighty can save those teeth; they are past saving, I will assure you of that." She called upon Dr. Younger and he saved the teeth, and it was six years after that treatment I saw the lady's teeth; they were firm, not relatively but absolutely firm, and the gum tissues perfectly restored, I could not see any difference between them and the adjoining teeth. It was an eye-opener to me.

On Dr. Younger's visit to Boston a year ago last October, at the Knight Templar encampment, on his return here he remained over a day or two, and some of us met him, and as I had become very much interested in his treatment in California, suggested to him to remain over here for a while to let the dentists see his methods, by taking their difficult or hopeless cases. He arranged to do so, and was here last winter, in February, and remained until July, and I saw many cases under treatment and completed, some exceedingly bad ones. The first patient he had was one whom we put under his care; in treating the pyorrhœa he noticed the gentleman wearing three incisors on the lower jaw attached to a rubber plate. He suggested implantation; the gentleman said, "Very well, implant." Those teeth were implanted. The gentleman was so well pleased with that implantation that he afterward implanted two or three bicuspid, two I think on the lower jaw and one on the upper. His teeth are in splendid condition. The gentleman has been delighted with the work and did not object to the amount of the bill at all, but paid it with a great deal of pleasure, and in fact said he thought the operation was worth it.

My wife has lost nearly all her superior posterior teeth, she has but two bicuspid remaining; they have loosened and dropped out; she has picked them out herself, never allowed anybody to extract them. I had become so thoroughly convinced that her case was hopeless, that there could be nothing done for her teeth, that I never had anything done. Dr. Younger took her in hand last winter, and those two bicuspid remaining were very loose, the right especially. I said to Dr. Younger, "I do not think it is worth while to do anything with that; as I am going to put in a plate." He said, "Yes, I will save that tooth." It has tightened up, although absorption has taken place very extensively; the gum margin is restored, and the tooth is held firm by the membrane, not by any reproduction of the alveolar process. On the lower

jaw two molars had become very loose, in fact, I thought it was only a question of time when they would be extracted. Those teeth are perfectly firm under his treatment. His methods are exceedingly simple, and depend entirely upon the removal of every iota of deposit and that, I am satisfied, depends upon the exceeding delicacy of touch. I do not think that every dentist has that delicate touch that would enable him to remove every particle of deposit. Dr. Allport had this delicacy of touch in manipulation to an extent that I have seldom seen elsewhere, and Dr. Younger has it to a remarkable degree. His use of ligatures in retaining teeth as well as in the correction of irregularities is to me something remarkable, doing it with such exquisite ease and so completely successful that it is worth while to witness his operations. He is always ready to meet members of the profession to answer any question; he has no secrets whatever, and ready to tell all he knows about it and show how it is done.

Dr. CROUSE: I wish to discuss to-night only one phase of pyorrhœa, which I regard as a fatal one, and I do not think it has been touched upon here. It is where you have excruciating pain. There is no looseness of the teeth, no breaking of the tissue around the necks of the teeth, but you have the formation either before or after, and I presume the formation is going on while this pain is at its height. This formation comes close to the end of the root, or between the roots of a molar tooth, and I want to see the man living who can diagnose where the deposit is, and who can then take that kind of a case and treat it. I am not able to get rid of the difficulty and dismiss my patient, saying "Now you will never be troubled again." The same influence that brought it about the first time will bring it about again, and so I am never quite sure enough to tell the patient that there will be no further trouble. You might just as well say that a patient will not take a second cold or become debilitated again. That is the difficulty about pyorrhœa, the tendency to recurrence. Dr. Younger and I have a case in hand together, that is, I had it quite a while ago, he got it, I got it back again, and now he has got it again, at least I hope he has, and that he is treating it successfully. It is a form of pyorrhœa, not as has been described by somebody where the teeth lift out of the socket and are put back again, but it is a wasting away of tissue around the process, so that one-third of the roots are exposed and the teeth so loose at times that you could move

them easily. I have had that case in hand for ten years and have had the teeth firm three or four times and back in place, but they are always uncomfortable, having much sensitiveness. There is a certain amount of erosion going on, so that I do not think it properly comes under pyorrhœa, but is a case of erosion, and I do not think anybody knows anything about erosion. I have a theory that suits me pretty well, but I dislike to have anybody ask me to prove it.

Dr. BROPHY: I am glad to see that this question is coming down to a discussion upon principles. When this question of pyorrhœa alveolaris first came before the profession for consideration it was held up to be something deeply mysterious. It was thought to be something that was not comprehended by many and something that was hardly ever cured. It is a condition that exists elsewhere in the body under other names and when we have come to understand that it is only a chronic inflammation of the pericementum established through some local irritant, then we will have arrived at what is the matter, and when we have come to that conclusion, then we simply have to address a remedy to the disease. I do not take any stock at all in this theory of uric acid in the blood causing pyorrhœa alveolaris; if that did, all the teeth would be affected in the mouth in the same way. I do not believe it, it is a local affection and it is more marked in patients suffering from general debility. The patient runs down in health, the condition grows worse under this influence. What we want to understand is the principles in pathology upon which this disease is based. A foreign substance, an irritant, produces an inflammation that runs into a suppuration and a loosening of the teeth. Now what we want is to get at the disturbance and remove it. A patient has a piece of steel or wood or any foreign substance thrust into the tissues which would be sure to give him annoyance. Are you going to give him medicine? No. Remove the cause, which would be the foreign substance, and the patient will get well. The whole matter rests on fundamental principles that are as old as the history of surgery and when we come to understand these principles, then we will understand how to treat pyorrhœa alveolaris. I do not believe that if a patient gets teeth so loose that he can twist them with his fingers, that they can get firm and well. It does not reside in the power of man to produce bone. We cannot make alveolar processes that have been wasted away by disease to grow

again, so that when they are gone and when the teeth rest only by means of slight attachment of membrane at the end of the roots, without bones surrounding any of the root walls, the teeth are lost, and a tooth like that should be removed, and when we undertake to produce an alveolar process, and when we tell a patient that a tooth can be fixed and can remain firm, I believe we are doing ourselves and our patients an injustice. We are leading them to a great loss of time and money, and we are throwing upon our profession a burden which is not easily removed, that is, representing that something impossible can be done.

Dr. CROUSE: I want to ask a question of Dr. Brophy. The statement was made, I think by him, that if uric acid was the cause all the teeth would be affected. Now there are quite enough of them affected at one time to suit me, but then I do not think it is proven by the assertion necessarily that all of them should be affected. You have a patient suffering with rheumatism and one or two of the fingers will be swollen, or one hand will swell and the other be free from it. I am here in that condition to-night.

Dr. BROPHY: What is the question?

Dr. CROUSE: I want to ask why it is generally understood that uric acid is the cause of rheumatism?

Dr. BROPHY: That is one of the causes.

Dr. CROUSE: Well, you have seen patients where one or two fingers on one hand were affected, so why should not all the fingers be affected, and the same way with the teeth? That does not answer the question. You condemn the theory, but it does not prove it untrue that because all the teeth are not affected that it is not uric acid.

Dr. BROPHY: What is the question?

Dr. CROUSE: The question is why all fingers do not swell if uric acid is the cause of rheumatism, or if uric acid is the cause of pyorrhœa, why all the teeth are not affected at once? That is your question; you said they would not all be affected, and I said that does not prove anything.

Dr. BROPHY: I would like to have Dr. Crouse ask me something that is easy, but since he has put the question in that way I would say that the teeth are all affected, but some more than others. Fingers are more or less affected according to the amount they are used. You will find a dentist who is affected in the fingers and it will be the fingers of his right hand; and you will

find that it is simply a question of use, apart from special irritation. I think that is as clear an answer as I can give.

I wish to correct a statement regarding a remark made by me. I did not intend to say that bone could not be reproduced by Nature when the periosteum is intact. I did say, and I say again, that the alveolar processes when once lost cannot be reproduced, and are not reproduced. They will not grow up again around the teeth when they have once been absorbed away by the destructive process. That is what I wish to state; and while I am on my feet I wish to make another statement, that is, following an old, time-honored practice, when a part was diseased it was put to rest; and when we have a tooth that is loose, or pretty loose from the effects of this disease, our first duty is to put the part to rest as nearly as possible; and to do that sometimes fixes it so that it will not move around readily, hold it steady and firm. Then we can proceed to remove any deposits, make use of such remedies as indicated, and it is possible by fixing the teeth by splints to preserve a tooth that is loosened and affected with this disease. We can do it best in that way.

Dr. YOUNGER: I would like to ask the gentleman a question. He says alveolar process is not reproduced. Now in implantation we know that those teeth after they have been planted are much more hard to remove than the ordinary teeth. In fact it was impossible sometimes to remove them except by breaking down the wall or by drilling out the tooth.

Dr. BROPHY: That is the filling in around the tooth, but the process does not grow up or down as the case may be. Do you think it does? When you implant a tooth, does the process grow down?

Dr. YOUNGER: I think it does.

Dr. HARLAN: Closing, I am very glad to have afforded a discussion for members of the society. I did not claim that I cured all cases of pyorrhœa; if Dr. Younger did, why that is another thing. I exhibited a good many specimens of teeth that I have taken out. I did not say who had treated them before. I am not infallible and I do not pretend to be, but there are some things that I know just as well as other people, and I know how to use wires as well perhaps as Dr. Younger does the use of silk. I can get the same results with fine wires, I mean the results that are satisfactory to me. I do not say that that is better. I advocated

the use of the wires for their therapeutical and mechanical effects combined, and I do not believe that there are any therapeutical effects that can come from the use of silk. The fact of the matter is that loosening the teeth is a very serious subject and it deserves a great deal more careful study on the part of dentists than they give it, and if they take each individual case and do their level best and treat them, no matter whether there is one remedy or half a dozen, so that they get a good result, then it is a benefit to the people.

Dr. Mawhinney asked me a question while the discussion was going on, as to whether a tooth which had been cured, as we understand the term cured, whether it was more liable to have recurrence of disease than any other tooth in the mouth. I do not think that it is any more liable to a fresh attack than the others, provided the adhesion of the tissues to the roots of the tooth may be nearly perfect.

Of course in Chicago we do not have the mucous membrane lining the socket of the tooth, and consequently there can be no mucous secretion and so the pockets will not become foul in consequence of that. I just want to say that Dr. Younger perhaps made a slip of the tongue in what he said about the mucous lining in the socket; now we do not have that kind of mucous membrane in Chicago.

Dr. YOUNGER: Yes you do when you have pyorrhœa, after it is suppurated. That pocket is lined with mucous membrane.

Dr. HARLAN: I am glad to learn that we have such a mucous membrane. New facts in pathological histology do not come to us generally so easy!

Dr. HARLAN: I do not use any solutions of medicine around the roots of teeth without first preparing them for the case in hand, and when I am through they are poured out and not used for a second person. There is no chance for infection. If you get into the habit of taking your medicines and using them in a neat and truly pharmaceutical manner, you would not get into the habit of doing anything else. In filling these up (referring to beakers) I always use hot water, so that I never chill the patient's teeth, chill his mouth or anything like that, so that the solution is ready to be used at the moment. I take a platinum or gold pointed syringe, the point of which is passed through the alcohol flame before it is introduced into a pouch or pocket and before it is introduced into the next one, held in the flame again. In that way there is no possible chance for carrying infection from one pocket to another, or where the gums seem a little red or inflamed, before a probe or anything like that is introduced beneath the margin of the gum it should be sterilized with heat or silico-fluoride of sodium saturated aqueous solution.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

Meeting of December 14, 1896.

On motion, the regular order of business was suspended to enable Dr. Brophy to exhibit a patient.

Dr. BROPHY: This young man whom I have here this evening has, as the model will show, an extensive cleft of the hard and soft palate, originally extending farther into the nose. In his early childhood an operation was made upon the lip for closure of the harelip. The model that I have in my hands shows the condition of the patient when the young man came to me. He was sent me by a member of the profession of this city, Dr. C. N. Thompson. My desire is to show the extent of the cleft, giving the general structure and form of the palate. The model of the soft parts is not very accurate, but it shows the distal wall of the pharynx and also the breadth of the cleft and the length of it.

Dr. Brophy then brought forward his patient and explained the details of the operation, saying: You will see at once upon examination that the plates have served an excellent purpose, for they have not only served the purpose of producing tension upon the whole of the surface of the palate in holding it together until union could take place, but they have acted as a splint and they have actually put the palate out of use until union has taken place. The palate is now rigid as a board, because it is held so by means of the plates and also by silver sutures. In this case there is an abundance of tissue, so that when the plates are removed, the palate will vibrate and it will perform every function that it is possible for a plate to perform.

Dr. GILMER then read a paper on "Fractures of Maxillæ."

DISCUSSION.

Dr. BROPHY: I hope that the doctor will consider it proper for me to go a little outside of his paper to speak of some phases of fractures. I think he has covered quite as much in his paper as it would be possible to do in the length of time that he has given to it.

The preternatural mobility of the bones after a fracture is the most positive guide to us in making a diagnosis and deciding what is to be done in the construction and adaptation of splints. In other words, we find a displacement, we note the displacement, and then we put our ingenuity at work to adopt a plan by which

that displacement may be overcome and the parts may be put in normal position and held in quiet contact until union may take place. It often happens that in fractures of the jaw a tooth is loosened, it may be forced out, absolutely displaced, and my experience has been that the saving of the tooth, even though it may be completely removed and the putting of it back into its place after cleansing it antiseptically, and the socket from which it came is a means of aiding us in securing the proper relation of the two parts.

So in the case of a double fracture or triple fracture in retaining the parts in the proper position. It so happens, when a fracture occurs at the angle of the jaw anterior to the attachment of the masseter muscle that most people who sustain a fracture of that character will apply to a dentist to have a loose tooth extracted. They feel the short fragment lifted, the tooth is a little higher, it is easily moved and they apply to a dentist, not knowing the bone is broken, and I am sorry to say that I have seen a few cases where a dentist has unwisely removed the tooth, in that case the only tooth that remained in the short fragment of the bone. I would say here the nomenclature employed by the doctor is not exactly the same as that that I have employed. In speaking of fractures, he speaks of the distal fragment. I will speak of it as the short fragment and all that portion of the bone embracing the greater part of it I will speak of as the longer fragment. It is only a matter of terms; perhaps we all would understand what distal fragment would mean, also understand what short fragment would mean.

Now in case of a tooth in such a position as that I was describing, attached only to the short portion of the body of the bone and the ramus, in case of fracture; it is a matter of great importance that that tooth be retained, because we can make use of the tooth as an anchor to assist us in holding the broken fragments in apposition. If it be removed, then we have no other recourse than to wire the bone, or to employ some means of counteracting the great force of the masseter and pterygoid muscles in lifting the ramus. In any event, wherever a tooth may be displaced or loosened, it is the duty of the dentist or surgeon who has the case in hand to keep the loose tooth in place. It will almost always become firm in healthy people, far more so than it would naturally in feeble people, and in almost all cases

where those teeth are replaced, they will become firm, and then we can adjust our splints and have the benefit of its support in getting the proper occlusion of the two jaws.

The doctor has spoken of the different kinds of splints. I do not know how many kinds of splints there are for fractures of the jaw; I suppose there are just about as many kinds of splints for fractures of jaws as there are different kinds of amalgam; I have seen probably forty or fifty or sixty kinds myself of different forms. But the question that we have to consider always when we have patients with a fractured jaw is, how can we treat the patient with the least discomfort to him and secure the best result, and I am of the opinion that in about 95 per cent of all the cases of fractures of the lower jaw we can treat the patient without any external appliance. In an edentulous jaw the condition is different; the doctor had not time to speak of fractures in edentulous jaws; he could not go over all these things, we cannot either, but when the teeth are present we can almost always adjust splints that will serve the purpose, and the patient can go about his affairs without a clumsy device fastened to his face. In such a case as the doctor has described, where there was a fracture of the superior maxillary bones, lifting them away from their attachments, an external appliance seemed wise, and I want to commend the doctor on having so skillfully adjusted the appliance as to restore the patient under those conditions.

The splint that he describes as Kingsley's, I think was made long before Dr. Kingsley was born. The method that he described in taking an impression is one I would use, and then I would divide the cast by means of a ribbon saw and adjust the mold so as to restore the occlusion of that against a model which I would also make of the upper jaw, so as to restore the proper occlusion of the teeth; then I would make a die and counterdie, and I would swedge an aluminum splint to fit down all over the teeth, clear over the distal part, taking in all of the lower teeth. Then having swedged such a splint I would take it to the patient and carry the fragments to their proper position, put it in place, see that it was all right, make the edges very smooth, and then by means of a very ingenious little forceps that Dr. Edmonds has designed, I would fasten the splint in place. If possible, I would like to use the rubber dam on all the lower teeth. Then I would wash them all off carefully with a little alcohol, so as to remove

any deposit of mucus, fats, etc; clean them thoroughly; have them absolutely dry. I would moisten the surface of all the teeth with phosphoric acid, then I would mix up some oxyphosphate of zinc to about the consistency of thick cream, and set the splint with it, having an assistant to assist me in putting the fragments in their proper position, and then with this little forceps described I would go around the teeth and I would crimp the aluminum in between them, and if need be, take a burnisher and burnish all around, and keep it on there for an hour; when the oxyphosphate of zinc gets hard the rubber can be cut off with scissors and the patient will be left as comfortable as is possible under the circumstances. He can wear the splint six or eight weeks; he can chew his food, he can attend to business after the acute inflammation subsides and no one would suspect that he had a fracture of the jaw, unless they notice the luster of the metal when he opens his mouth. When the time comes to take that off, you will find it is quite a task to do so. You need to cut it off generally, or to make use of a thin instrument and pass it between the teeth and splint, and take the aluminum off here and there, after which you will have to get the scale off formed by the oxyphosphate.

I will say this to some of the young men who may have used oxyphosphate of zinc in cementing on regulating appliances, where you want to cement on a band; a few years ago I cemented on a little cup shaped cap on a cuspid tooth, the point of cusp only having emerged through the gums. I did not want to drill a hole in the tooth and put in a screw, and I concluded to try this means of moving the tooth to its proper place. I made a cup shaped cap of gold, moistened the surface of the tooth with oxyphosphate of zinc, and cemented the cap onto the tooth. I used ligatures and bands to move the tooth, and the cap stayed in place until the tooth was in its proper place. I might say in passing, while on the subject, that that is a good way to put a crown on.

If we make use of a simple device like this we are doing the best possible service to our patient. The ligating of bones by means of silver wires I have employed in a number of cases, and I have had different results. They will almost always do their work pretty well; in some cases there would be disturbance, and I had in one case a suppuration surrounding the wired suture in the case of a double fracture. One fracture occurred near the cuspid tooth on the left side, and the other just in front of the angle of the jaw

on the right side. I wired these bones together, and the wires that were placed in the anterior fracture gave me no trouble; they became encysted, and are there now. The other side caused me trouble, and I was obliged to remove the wires. The bone, however, united in that case. I found no hæmorrhage at all from the facial artery, as that vessel had been obliterated at this point from the injury.

I have here this evening illustrations showing a very simple device for correcting fractures. I first used such appliances many years ago; they have served my purpose well.

(Dr. Brophy here proceeded to explain illustrations of various devices.)

There is one statement that the doctor made that was sufficiently impressive, but I would like if possible to make it as impressive as can be, and that is thorough cleanliness in such a case. Most patients who have sustained fractures are apt to be uncleanly; that is, they do not observe the laws of hygiene as applied to the mouth following fracture, and that has so much to do with the result. If we have a compound fracture where the bones pass through the tissues, we are apt to have an extensive inflammation; and as a result we may have, in case the parts are not properly treated, an ununited fracture, or we may have cartilaginous union that never will effect a complete, permanent, osseous union. This cartilaginous union is objectionable. If we have a cartilaginous union there is only one treatment, and that is to open and remove the tissue, freshen up the ends of the bones, and then attempt to get an osseous union. I have never seen a case where the bone was wired around it that the parts could be held firmly in place. The wires will become loose in a little time by the absorption of the bone, and the parts will be movable.

The general principle that has been employed and argued and discussed in surgery from the beginning of surgery down to the present time is, that when a part is in an abnormal state, it should be put to rest. We cannot always hold it perfectly quiet; no matter how effective our appliance may be, no matter how carefully we adjust it, there will always be some slight movement, but that slight movement does not prevent a union.

Dr. CASE: I have listened with pleasure to the paper by Dr. Gilmer and the opening discussion by Dr. Brophy. The subject of fractures of the lower jaw is one that ought to belong exclusively

to the dental profession, but unfortunately a large proportion of these fractures, in fact almost all fractures of the maxilla, as in fractures of other bones, are taken to the general surgeon. The result is that the dentist rarely sees any but the most difficult cases that the general surgeon finds he cannot reduce without the skill of a dentist. Most writers and speakers upon this subject represent the operation as one comparatively simple. Dr. Brophy's description of how he would proceed in a case of fracture of the lower jaw would lead you to believe that no difficulties ever arose; whereas the fractures the dentists are liable to be called upon to treat will often present difficulties of the gravest character even to the most skillful operators.

It has been my fortune to treat a few fractures of the lower jaw that could not be reduced with anything like the ease and simplicity described.

In 1880 there was a fearful railroad disaster at Jackson, Mich. Among the sufferers was a man who now lives in this city. Of numerous fractures and injuries he sustained was a double fracture of the lower jaw. One fracture was transverse across the body of the jaw between the left cuspid and bicuspid, and the other was obliquely upward and inward across the right ramus. If you never have had the treatment of a fracture of this kind, I think you can hardly appreciate the influence which the inflamed and tense muscles will have upon the isolated fragment of bone and the difficulties of forcing the several parts into their proper relations. The os hyoid muscles pulled the anterior portion of the isolated fragment downward, while the masseter and pterygoid muscles lifted the posterior end, turning the entire fragment in its bed and sliding the ends along the oblique fracture. I was called to the case about ten days after the accident. In the meantime there had been several attempts to reduce the fracture and hold it in position by some of the most skillful surgeons of Michigan, among whom was Professor Donald McLean, of the University of Michigan, assisted by Dr. W. H. Dorrance. All the methods and devices that were attempted had failed. I found the patient with the mouth gaped wide open and tissues in a fearfully inflamed and swollen condition. I knew nothing at the time about operations of this kind, but I felt I must do something. And so I attempted to replace the fractured section with a view of getting an impression for a rubber splint. After inflicting a good deal of unnecessary

pain upon the patient I gave that up, for I found that with all the power of my hands that that was impossible. I then proceeded to take an impression; that was useless because of its imperfections, and went home and slept on the subject, though I hardly closed my eyes in sleep that night thinking how I was to accomplish the operation, when it suddenly occurred to me to take impressions of the lower jaw in sections and reconstruct a model of the lower jaw by articulating them to a model of the upper. I believed I had made a great discovery, but afterward became aware that the method had been discovered and practiced by others and was fully explained in Hamilton's Surgery.

Fortunately in this case the teeth were all strong and the occluding facets well marked. This enabled me to construct a rubber splint that covered the lingual portions of the teeth and gums of the lower with extensions which covered the occluding ends of the molars and bicuspid, and so shaped to properly occlude with the upper for masticating purposes. This was first firmly wired to the bicuspid and molars on the left side. Then pressure was made under the chin, lifting the anterior portion of the fragments into its place in the splint—the masticating extensions resting upon the molars served as a fulcrum to pull the posterior end of the fragment down to its relations with the ramus. But let me assure you right here it was no child's play, but one that was accomplished with the greatest difficulty of anything I ever attempted. However, it was so successful, and considered by Dr. McLean so skillfully performed, that afterward when I entered the medical department of the university I was invited each year to give lectures to the students on fractures of the lower jaw.

About two years after this case I was called to another which differed from it only in the fact that the anterior fracture was on the right side and the posterior upon the left. Remembering some of the difficulties I experienced in the former case in the construction of the splint and the operation of reduction, I was able to accomplish the operation with certain improvements that assumed greater ease, perfection and certainty of success.

If you are ever called to a case of this kind, or any case where the fractured portions are carried far out of their normal positions by the tension of muscles, do not attempt to replace the parts and take an impression of the entire lower jaw, with the view of sawing the model apart to reconstruct it, as described by Dr. Brophy.

That might do in a simple single fracture, though I can see no reason why even then that a sectional impression could not be taken with greater ease and certainty of success, and especially if there is a loose fragment which should be held firmly in the impression while it is hardening.

In diagnosing a case it is necessary to ascertain the position and direction of the fracture or fractures to know the influence of forces which tend to carry the parts out of the proper relations. It would be well to ascertain at this time also if there are comminuted fragments that will prevent the fractured surfaces from coming perfectly together. Were it not for this I would advise you to make no attempt to replace the parts until you are ready for the final reduction.

The impressions can be taken in plaster by using small trays of sheet lead, cut and bent to fit over the parts. In reconstructing



FIG. 7.

the model care should be observed in not placing the parts too close together, or in any attempt to make a perfect fitting plate, as we as dentists understand it. The reconstructed model may be covered with heavy tin foil or a thin layer of plaster laid on with a camel's hair brush, filling the spaces between the teeth and the sulci of occluding surfaces.

In the second case which I referred to I used a submental clamp having forks which rested on the splint and connected with the chin-piece with a thumb-screw. (Fig. 7.) This reduced the difficulties to a minimum by forcing the isolated fragment into the splint and holding it there, while the hands were free to perfectly wire it to place. It is so constructed, as you will see (exhibiting

it and applying it to the mouth of his assistant), that it can be worn, if necessary, with comfort for several hours or days, or re-applied at any time when you see that the parts are pulling away from the splint and require rewiring.

Dr. GILMER: This paper was written for the young men of this society, and I had hoped that they would have taken up the subject and discussed it.

Dr. MAWHINNEY: I would like to ask Dr. Gilmer what is the simplest method of bringing the fragments into position and retaining them in a simple fracture in an edentulous lower jaw?

Dr. GILMER: The simplest method is to wire through the bone.

Dr. MAWHINNEY: Getting the parts in position is the difficulty.

Dr. GILMER: Yes, there is a difficulty in properly adjusting the fragments of such a fracture and holding them in place. If a patient has artificial teeth we may use these as a splint by wiring the upper and lower plates together; or we may take the artificial teeth, place them in an articulator and reproduce in rubber that part of the plates which covers the alveolar border, joining the upper to the lower by four pillars of rubber. The jaw being wired together, this splint is placed in the mouth, the lower jaw being held in position by a bandage.

Dr. MAWHINNEY: Is it ever practical to break a fracture that is united in a wrong position and unite the parts again? I remember seeing a young man some years ago where the fracture had been united in such a way that he had absolutely no use of half of his teeth. You could put your fingers between the upper and lower teeth on one side.

Dr. GILMER: I will answer Dr. MaWhinney's question a little later on, as I have something to say on that subject. I have been pleased with the remarks of Dr. Brophy and Dr. Case. In 1881, I presented a paper on fractures of the inferior maxilla to the Illinois State Dental Society, in which I covered the subject as fully as I could, and went into details regarding it. It required an hour and a quarter to read the paper. But I did not feel like going into detail to-night and wearing you out, as I should certainly have done had I brought the subject to you in full; therefore, I have left a great deal to be taken for granted.

Dr. Case's reference to the treatment of these fractures by

surgeons brings me to the question of Dr. MaWhinney. I am one of those who do not feel like criticising physicians or surgeons about the mistakes they make, because we make quite as many I imagine; but will say that occasionally a surgeon feels wholly equal to a case of this kind when he ought to call in a dentist to help him, or else turn the case over to some competent oral surgeon. I have recently had a case of fractured lower jaw where there were two fractures, one on either side which had been under the treatment of a surgeon without the aid of a dentist. There was a good union on the right side; on the left no bone had formed, and the jaw was carried at least half an inch to the left of median line, so that the posterior teeth did not occlude at all. Even had there been a bony union the patient could not possibly have used the teeth for mastication. I decided that the jaw should be reset in a proper manner. I should not have hesitated to do the same thing had there been a bony union, because the patient was so disfigured by the malposition of the jaw that I should have been justified in rebreaking and resetting. The surgeon who had treated the case originally suggested that the patient could have the teeth regulated after the bony union was complete, but the conditions were such that this attempt must have proved futile. I succeeded in forcing the jaw into place, and then by means of wires securing the upper to the lower teeth.

DR. FREEMAN: Will you state more definitely how you wired the teeth together?

DR. GILMER: I placed wires around the necks of a number of the upper teeth on both sides of the mouth, and around a similar number of teeth on the lower jaw on both sides. Then I forced the jaw into place, it required considerable effort, and while my assistant held the teeth in occlusion I united the wires of the lower teeth with those of the upper by twisting, which locked the lower teeth firmly in place against the upper. This is a very simple method, and its application annoys the patient much less than taking impressions and adjusting splints.

THE PRESIDENT: Have you had any cases where you have had trouble from nausea?

DR. GILMER: No, but I never put any sort of appliance in the mouth which binds the jaws together, which the patient cannot remove himself until I am sure that there is no solid food in the stomach. As a precaution for the first day,

when I have wired the lower to the upper teeth, the nurse is supplied with clippers and in case of vomiting the wires are to be cut off.

Dr. MAWHINNEY: Was it not necessary in this case where you had no union to freshen the end of the bone?

Dr. GILMER: Yes, I took out a necrosed tooth and freshened the surface of the bone. Dr. Case spoke of taking impressions in sections. That is entirely practicable and in the paper I referred to, this method is fully discussed and recommended, but I omitted speaking of it as I did so many other things, because I could not cover the whole field. Dr. Case recommends covering the plaster teeth upon which the splint is to be formed with soft plaster, that the sockets in the splint may be a little larger than the teeth that they may readily go into place in the splint. This is a matter of importance. In the Kingsley splint which I passed around you will notice that the sockets in the rubber are smooth. I put a heavy coating of gum sandarac varnish on the cast which increases the size of teeth and permits them to come out of the flask smooth. By this application of the varnish the sockets are sufficiently enlarged so that in most cases the teeth will go up readily into the splint without further enlargement. The splint that Dr. Case showed you (Fig. 7), is an ingenious appliance, and his treatment of the case described was very skillful. In the paper before referred to I fully described a similar appliance made by Dr. Black.

Dr. FREEMAN: I was present at the clinic where Dr. Gilmer wired the teeth into position on a fractured lower jaw by means of wires entirely and with perfect success.

DEDICATION OF THE CHICAGO COLLEGE OF DENTAL SURGERY.

The dedicatory exercises of the new buildings of this college took place on Friday evening, December 4, 1896, when speeches were made by Dr. Truman W. Brophy, W. M. Lawrence, D. D., Judge Richard S. Tuthill, Dr. John B. Hamilton, Professor M. P. Thomas, of Lake Forest University, and Dr. C. N. Johnson.

Dr. Brophy, the Dean of the College, opened the exercises with a brief address in which he touched upon the growth of the college and of the history of dental education in the city of Chicago. He said the Chicago College of Dental Surgery was the first

institution of its kind in this country to introduce and use for the benefit of its students a complete apparatus for the cultivation of bacteria, thus demonstrating the active agents that cause caries of the teeth and methods for effecting their destruction. The institution was the first to organize freshmen students into classes for practical work in dental technology, both operative and prosthetic. In addition to these innovations in teaching, clinics were organized in the college and conducted for the benefit of the senior students by the most skillful and successful practitioners. Realizing the necessity of securing a permanent location for the college the lot was purchased upon which the building now stands in 1888, situated on the corner of Wood and Harrison Streets. The first section of the structure was erected in 1893, and the first course of instruction began on November 1 of that year. Beginning with the present year plans were perfected and the building of 1893 has been doubled in capacity, so that the college now consists of a six-story structure, having a frontage of 86 by 120 feet. Each floor contains an area of 10,080 square feet, divided in accordance with suggestions and plans made, after having carefully examined the best regulated dental schools in the United States, thus enabling the faculty to incorporate the most modern features in its construction. Dr. Brophy then traced the growth of the college from the summer of 1883 up to and including 1895-96. The faculty of 1883 consisted of three, matriculates eighteen, and no graduates.

In the session of 1895-96 the college has 87 teachers and 503 matriculates.

The next address was delivered by Dr. W. M. Lawrence, who said that he knew of no similar history along educational lines anywhere. He had the honor to be somewhat connected with the Chicago University, and its growth had been phenomenal; yet at the same time he could say pretty accurately that the figures given by Dr. Brophy proportionately exceeded any statistics which we might have the pleasure of presenting for the contemplation of the citizens of Chicago. He congratulated the faculty on having erected such a fine structure.

Judge Tuthill was the next speaker, and said that when he was a boy people never had their teeth attended to, and that every old man and old woman must have been toothless; that they went out of the world in about the same condition as to teeth

that they came into it. At that time every one seemed to think it was the normal arrangement, and that people when they got old had no business with teeth. He believed that nothing had been done in medicine or surgery that had so added to the happiness of mankind as the work that had been done by skillful dentists.

Professor Thomas followed Judge Tuthill. He was glad to see evidences that the Chicago College of Dental Surgery was not simply growing in extent, but becoming a genuinely progressive institution; an institution which is adding not simply to numbers in its faculty and students, but to its curricula, to its enlarged and advanced requirements; an institution which means a better educational product, men who are better able to do the special work to which they are called and to which they are devoting themselves by virtue of the broad, generous culture which the college was giving them.

Dr. John B. Hamilton, Professor of Principles of Clinical Surgery in Rush Medical College was the next speaker. He said that we were apt to think, in the clamor of a jubilee, that everything was modern with which we had to do; that we forgot the filled teeth of the mummies and the Aztecs, and the specialism which existed in the old Alexandrian school. Coming down to modern times we could congratulate ourselves that after a long period of darkness the revival of dentistry was due to America. In 1887, when he was executive officer of the first international medical congress held in this country, the question of the representation of dentistry as a distinct section came up; and after due consideration it was decided to give full accord to the dental profession in that congress the same as to any other branch of medical science. It was greatly to the credit of this country that this was done, as America had reaped the benefit of it. The French Government sent a representative over here to inspect and investigate our dental colleges and to report to his Government as to their condition, and what he thought of our method of teaching; and this report, by Dr. Kuhn, of Paris, on the dental art in the United States, was, in the opinion of Dr. Hamilton, one of the most comprehensive reports ever published on the subject. At the same time the report was most flattering in that the author stated that European dental colleges could in no way compare with those in the United States. Dr. Kuhn spoke particularly of the Chicago College of Dental Surgery, but which at that time

was under different auspices from those at present. The Philadelphia Dental College was particularly mentioned. After citing the different conditions that prevailed in dentistry in foreign countries and comparing them with the dental colleges in the United States, he (Kuhn) framed a bill to be presented by the Minister of the Interior for transmission to the French Chamber of Deputies, with a view to procuring a charter for a dental college in Paris that would compare favorably with American dental colleges. No higher praise could be accorded American dental colleges than the compliment paid to them in this report.

As to Dr. Evans, Dr. Hamilton said he was more than an ordinary practitioner of dentistry; he was foremost in the sanitary work of the Franco-Prussian war. The so-called American ambulance was the creation of Dr. Evans. Dr. Evans left his patients, went to the front, organized an ambulance service, and while French surgeons were busy caring for the wounded, Evans was busy with the ambulance corps in organizing general hospitals in the rear; and the story of the services of that noble, illustrious man in the Franco-Prussian war was enough of itself to elevate the profession to which he belonged to a high plane among the sciences and the educated men of the world.

Dr. C. N. Johnson in a brief speech said the first dental college was established in this country in 1839, but it was difficult to get at the curriculum of that college at that time. The number of teachers and students at the opening session was four. Dr. Johnson then dwelt upon the importance of educating the public to a proper appreciation of the practice of dentistry. He said that the laity needed education along this line. The people should be taught that the highest aim of dentistry was to add to the comfort, the longevity, the physical beauty and happiness of the human race.

At the conclusion of Dr. Johnson's speech the students, faculty and invited guests repaired to one of the spacious operating rooms, where refreshments were served and short timely speeches were made by Drs. W. C. Barrett, A. W. Harlan, Thos. L. Gilmer, W. L. Copeland, Mr. C. G. Morrell and Dr. L. I. Skelton.

Excellent stories were told by Mr. W. Woodruff, the Arkansas humorist; Opie Read, the well-known author; Mr. Richmond, the well-known journalist, and Mr. W. B. Lockwood made a short speech.

Dr. C. N. Johnson recited a poem entitled "Our Quarrel."

Dr. R. B. Tuller was called upon to sing a song, but instead he asked the audience to join with him in singing Auld Lang Syne, which they did, and then quietly dispersed.

ANNUAL REUNION AND CLINIC OF THE ALUMNI ASSOCIATION OF THE
CHICAGO COLLEGE OF DENTAL SURGERY.

REPORTED BY R. C. BROPHY, M. D., D. D. S.

Wednesday, January 6, the Alumni Association of the Chicago College of Dental Surgery met at the college for its regular annual reunion and clinic. College work was suspended for the day and the building in its entirety thrown open to the visitors, many of whom had never before been afforded an opportunity to inspect the enlarged home of their alma mater.

In the evening a banquet was held by the association at the Leland hotel, which was much enjoyed.

Below we give a very brief summary of the clinics of the day and exhibits.

Riveting porcelain facings. The possibility of riveting porcelain facings without danger of breaking was effectively demonstrated by Dr. B. D. Wikoff, of Chicago.

Dr. Wikoff imbeds the facing in the end of a plaster of Paris cylinder about one inch in diameter by one inch in length, and when cylinder becomes hardened applies the hammer with sufficient force to quickly and perfectly rivet the pins.

Accurate methods for fitting Logan crowns. Dr. Charles J. Sowle, of Rockford, Ill., gave a practical demonstration of his method of adjusting Logan crowns.

Dr. Sowle dresses down root below the gum line all around, leaving it somewhat convex from labial to lingual, then prepares canal to receive the post of the crown. A false pin long enough to extend to occlusal surfaces of adjoining teeth is placed in canal, and an impression in plaster is taken, the plaster being allowed to partially set before forcing up for the purpose of crowding back the gum. The impression when dried is poured with fusible alloy, producing a metal model upon which the tooth is fitted.

Combination filling—precipitated gold and oxyphosphate. Dr. W. V-B Ames, of Chicago, commanded much attention in his operation of filling a cavity with cement in which was incorporated precipitated gold. This combination of gold and cement, it is

claimed by Dr. Ames, who originated it, produces a filling material of great practical value.

Gold filling, using cocaine crystals while placing cervical clamp. Dr. R. M. Pearce, of Rock Island, Ill., demonstrated the painless placing of the cervical clamp by the use of cocaine crystals, and inserted a large and very handsome gold filling, using a hand mallet.

A new method of anchoring bridge work. Dr. Geo. B. Perry, of Chicago, demonstrated a new and novel method of anchoring dummies to live teeth. The case presented by Dr. Perry was that of a cuspid dummy swung between and anchored to the left superior lateral and first bicuspid, both of which teeth were alive and having no metal visible anteriorly. Dr. Perry's method briefly described was as follows: Two small cavities were drilled in the bicuspid, one on the proximal surface well down toward the gum line; the other in the mesial groove of the cusp; these cavities being designed to receive the bifurcated bar, this constituting the anchorage at that end.

The novelty of the operation, however, was in the anchorage to the lateral. In this tooth a cavity just large enough to receive the end of one of the little platinum pins from a porcelain tooth, was drilled well down on the palatal surface. A piece of No. 29 pure gold plate is then burnished over the palatal surface of the tooth, and to this the platinum pin is soldered. The bar upon which is swung the dummy is now soldered to this and the whole is ready to mount, the lateral anchorage being made with cement, the bicuspid with gold or amalgam.

Orthodontia. Dr. C. S. Case, of Chicago, presented a patient upon whom he had accomplished a remarkable feat in orthodontia. The correction of a most distressing irregularity complicated with cleft palate, the patient being twenty-five years of age.

Bleaching by cataphoresis. Dr. J. G. Reid, of Chicago, demonstrated a method of bleaching teeth by cataphoric aid, the same consisting of decomposition within the tooth by cataphoresis of chloride of sodium. The operation was successful.

Platinum and gold filling. Dr. J. E. Hinkins, of Chicago, inserted a gold and platinum filling in a cervical cavity with excellent result.

Emergency crown. Dr. A. O. Hunt, of Chicago, exhibited and placed in position a crown termed by him an emergency crown. This crown which is designed for roots so badly decayed that the

use of the ordinary crown is precluded is made by burnishing platinum within the cavity to a line with the gum, passing a post through the bottom of this platinum cup and anchoring it as deeply as practicable in the root. Removing and filling the cup with solder, then attaching crown.

Formation of cavities in porcelain teeth. Dr. Geo. W. Whitefield, of Evanston, Ill., showed how cavities may be drilled in porcelain teeth without the use of diamond drill. From a piece of copper wire a bur is fashioned as nearly like the regulation bur as may be. By the application of finely pulverized diamond powder to this bur cavities may readily be drilled in porcelain.

Root treatment and amalgam filling. Dr. F. H. Robinson, of Aurora, Ill., filled a tooth, placing gutta-percha in the root canals, cement in the pulp chamber, finishing with amalgam. The amalgam being placed in the cavity while the cement was yet plastic.

Tin and gold. Dr. E. M. Robbins, of Carthage, Ill., inserted a filling of tin and gold, claiming advantages for the combination under a number of conditions.

Gold filling, hand mallet. Dr. C. P. Pruyn, of Chicago, inserted a very extensive gold filling, the cavity involving the mesio approximal and most of the occlusal surfaces of a left superior central. Dr. Pruyn removed the palatal enamel plate very extensively and left all the labial plate that could be saved, supported by a wall of dentine, claiming that by this procedure he could gain much greater strength and permanency than would result from an attempt to preserve both the palatal and labial plate.

Saddleback bicuspid. Dr. H. J. Goslee, of Chicago, exhibited a bicuspid crown of much beauty. It was made by fitting a saddleback to the cap, backing it up and soldering. It is a crown more easily made than a porcelain faced shell, and wonder was generally expressed by those who saw it why they were not more commonly constructed and made use of.

Appliance for holding rubber dam in place in cervical and buccal cavities. The dentist should be a man of resources, taking advantage of anything and everything that will lighten his labors and his patients discomforts. This sort of dentist is typified in Dr. W. H. Taggart, who has surprised his professional friends, notwithstanding they are always looking for something new from him, by discarding cervical clamps, shoving the dam up on the root and nailing it there.

A demonstration of this innovation in cervical work was made

by Dr. Taggart. Little brads about $\frac{1}{2}$ of an inch in length are made of number eight cambric needles, and sharply pointed; an ordinary automatic plugger point is broken off and slightly hollowed out on the end and is then magnetized. Placing this point in an automatic plugger Dr. Taggart places the little brad in position, where it is held by magnetism, forces the dam up where he wishes it to remain, places the little brad in contact with the cementum at a point where it will hold the dam, and with two or three light blows drives it into the cementum where it remains firmly until removed. The young man, a student at the college, on whom Dr. Taggart operated, declared that he suffered no discomfort from the insertion of the brads, and when removed no trace of the points of insertion could be discovered.

A new method of constructing Watts' metal plates. Mr. J. D. Porges (senior) exhibited models demonstrating Dr. H. J. Goslee's method of constructing Watts' metal plates, which was highly commended. Mr. Porges also exhibited Dr. R. C. Brophy's moulding compound and fusible alloy and shell and solid cusp, made by its use.

Cataphoresis. Dr. J. E. Hancock, of Chicago, gave a practical demonstration of cataphoresis in obtunding pain.

Surgical. Dr. Truman W. Brophy performed an operation for the relief of chronic antral abscess accompanied by polypi, and involving the nasal bone and ethmoid cells. The operation consisted in incising and deflecting the soft tissues beneath the cheek, no external incision being made, and removing a large portion of the anterior wall of the antrum, extending the opening well up toward the orbit. The diseased portion of the nasal bone was then removed, and the cavity thoroughly curetted.

Exhibits. While it had been my purpose to give a complete description of the exhibits of "Alumni day" lack of space precludes the publication of but a list.

Stephen Hexter, 199 Fifth Avenue, city, borolyptol; A. C. Clark Company, Chicago, fountain cuspidor; Dental Protective Supply Company, Chicago, general exhibit; F. H. Berry, Milwaukee, Wis., electric lathe; Dental Exchange Company, Chicago, cataphoric outfit, electric engine; Consolidated Dental Manufacturing Company, Chicago, teeth. Items of interest, Williams' gold, Dawson's specialties; J. P. Van Lackum Company, Chicago, high low Gould chair; S. S. White Company, Chicago, electric engines.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

THAT OLD CREOSOTE ODOR.

Several times lately we have removed cotton dressings from cavities in teeth and pulp chambers more or less saturated with creosote, in most cases covered with more cotton soaked in sandarac varnish.

On what basis a root or cavity dressing should be covered with such a mass of microorganism pesthouses we are not able to determine. Creosote, to begin with, is not a disinfectant, being simply an oleaginous antiseptic. It is not a destroyer of bacteria in the sense that a dentist should use it. It is not a deodorant or chemical disinfectant. It simply masks the smell of mephitic gases. It is very useful as a preserver of telegraph poles and fence posts. It is sparingly soluble in water, and is not an anæsthetic. It will not arrest pus formation used alone; when iodine is dissolved in it, it is the iodine that does the work. As for a sandarac dressing, the alcohol in which the gum is dissolved is not a germicide, nor is the gum. Why use it? The more or less porous meshes of the cotton after the separation of the gum by evaporation of the alcohol is a fruitful source of infection.

Users of such dressings as a rule are not careful in applying them. They seldom or never use the rubber dam in making such dressings to roots, and never adjust it when removing them. Contaminated saliva entering an aseptic root is just as bad for it as the food *debris*, etc., was in the beginning. If you must use creosote, use it on shingles or for preserving wood in some form, but never in the mouth.

THE NEW YEAR.

As we go to press the outlook is bright for a prosperous year in professional circles. The period of financial depression is about ending and every one may be encouraged. "The hard times" acts with greater force on doctors and dentists than any other class unless it be architects. People of means even try to economize on calling on the doctor or dentist. They go to dispensaries or infirmaries or do not employ any one. They ask for and get reductions in fees out of all proportion to such reduction in general merchandising lines. These conditions are rapidly disappearing, and if dentists will only be firm and patient, increasing their capacity for services, there will be no difficulty in having a fair credit balance at the end of 1897.

DENTAL SOCIETY UNION.

The prospect seems fair to unite the leading organizations at the coming meeting at Old Point Comfort, Va., in August next. If the conference committee can meet and agree on a liberal basis for future meetings at appropriate seasons of the year, there will be no difficulty, but if we are to meet forever and forever the first Tuesday in August we cannot agree. Why not follow the plan of the American Medical Association and meet in April, May, June and July according to the locality, so that climatic influence will not depress the activity of the members. We are in favor of the amalgamation on a broad basis and the distribution of offices, places of meeting, production of papers, etc., so that every one will have a chance to attend a meeting at least once in two or three years.

REVIEWS AND ABSTRACTS.

ARTIFICIAL ANÆSTHESIA. A manual of anæsthetic agents and their employment in the treatment of disease by LAURENCE TURNBULL, M. D., Ph. G., Aural Surgeon to Jefferson Medical College, etc., etc. Fourth edition; revised and enlarged, with illustrations. Philadelphia: P. Blakiston, Son & Co. 1896. Cloth, \$2.50.

This work has been in constant use in its several editions since 1878. The present edition is much enlarged and brings the

subject down to the present day. The historical aspect of the subject is very readably presented and with happy brevity considering the voluminous controversial matter which has been put in print.

To general anæsthesia is devoted the larger part of the book beginning with nitrous oxide gas which is exhaustively treated and very satisfactorily from a dental standpoint. The apparatus for its administration is well illustrated and methods of giving it are explained in detail, both when the gas alone or mixtures with other gases are employed.

The relative merits and dangers of chloroform and ether are very fully set forth, with ample quotation of opinions of the best authorities on the subject, both in this and the old world. Several tables of percentage of fatalities are also introduced. Bromide of ethyl has a deserved chapter and its peculiar adaptability in short operations pointed out. Conditions in which the different general anæsthetics are contraindicated are dwelt upon together with the most approved measures of resuscitation in cases of collapse.

Considerable space is given to cocaine and the newer hydrochlorate of eucaine. The use of cocaine by electrical osmosis is included and its efficiency upon dentine emphasized. Nothing new upon that question is given, indeed, what is said is largely taken from the columns of dental publications.

The book will be useful to the student for whom it would seem to be chiefly intended. The advertising matter of manufacturing chemists and instrument makers as well as writings of others have been laid under contribution to such an extent as to seriously impair any claim to originality which the author might make.

J. W. W.

DENTAL MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS. By CHARLES W. GLASSINGTON, M. R. C. S., L. D. S., Edin., London: J. & A. Churchill, 1896. P. Blakiston, Son & Co., Philadelphia. Cloth. Price net, \$2.10. Pages 266.

This is a neat and convenient book for handling in reading or for study. The type is good and the field covered by the author is quite extended. It is not quite the guide to practice as we find it, in the United States, that we would have liked. Nearly all of the newer methods of using drugs are found in the work but many of the newer drugs are not mentioned at all. Some older ones might,

with profit, have been introduced. A teacher would find himself somewhat at a loss to cover the field with this work but inasmuch as little or no general interest is manifested by members of the profession to do more than stereotyped dental medical practice, it certainly covers that field. The author falls into the too common error of recommending widely advertised trade-marked articles as remedies, when science utterly rejects them. If you want a new work of this character buy it and you will find much to unlearn and a few things born over again. The chapter on anæsthetics by Dr. Maughan is worth the price of the work. It is short and much to the point.

MEMORANDA.

Dr. Carl Heitzman died October 6, at Rome, Italy.

Eucaine in liquid vaseline, 2 to 10 per cent, for extraction.

The German-American Dental Society has been incorporated in Chicago.

Dr. Hodgen's work on Practical Dental Metallurgy is sold at \$2.50 per copy for single copies.

If you think a clinic is good for most of us, why not come to Chicago, Ill., about February 1-2, '97.

The jubilee of the discovery of anæsthesia is still being celebrated. First it was gas, then ether, and next, chloroform is in order.

THE SILENT REAPER.

Three notable men, active to the last, have passed away. Dr. James A. Swasey, Dr. W. N. Morrison and Dr. S. B. Brown. All of them were on the program of the Chicago Alumni clinic, January 6 and the anniversary clinic to be held February 1-2. Surely this is better than rusting out!

HAYDEN DENTAL SOCIETY.

The Hayden Dental Society elected the following officers December 21 for the ensuing year: President, Dr. F. S. Flagler; Vice President, W. E. Harper; Secretary, M. B. Rimes; Treasurer, A. G. Hayden.

A paper was read by Dr. Ottofy entitled, "Some Notes on the History of Dentistry."

M. B. RIMES, *Secretary*.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

At the annual meeting of the Odontographic Society of Chicago held December 14, 1896, the election of officers resulted as follows: President, George B. Perry; Vice President, G. W. Schwartz; Treasurer, Edmund Noyes; Secretary H. H. Wilson; Member of Board of Directors, W. H. Fox; Board of Censors, E. K. Beunington, Chairman, A. G. Johnson and H. J. Goslee.

H. H. WILSON, *Secretary*.

WISDOM !

Here is one of the speeches made by a Georgia solon: " Senator J. A. Stewart, of the Twenty-seventh, made a speech in which he said the board would be a foolish one and he didn't see why a man who had studied for three years and who 'toted a diploma' should go to this board and pay it \$15. There was nothing in going to school so long anyhow. There were just two jaws and thirty-two teeth, and any school boy in the State could learn all about dentistry in two weeks. The senator's speech created much laughter."

DAYTON, OHIO.

My dear doctor: —Here is an electrical formula for cataphoresis, which with a saturated solution of cocaine is approximately correct.

$$\begin{array}{ccccccc} \text{(Anæsthesia)} & & \text{(Time)} & & \text{(Volts)} & & \\ A & = & T & V & & & \\ & & & R \text{ (Resistance)} & & & \\ & & & \text{Very truly} & & & \end{array}$$

L. E. CUSTER.

NOTICE.

The second annual meeting of the Southern Wisconsin Dental Association held at Platteville, Wis., May 6 and 7, 1896, was well attended, there being present many of the prominent dentists of the State. The next place of meeting will be at Mineral Point, Wis., the first Wednesday and Thursday of May, 1897. Officers elected for the ensuing year are R. R. Powell, D. D. S., President; W. J. Morgan, D. D. S., Vice President; O. E. Gibson, D. D. S., Treasurer; J. H. Reed, D. D. S., Secretary.

DR. J. LEON WILLIAMS AT NEW YORK ODONTOLOGICAL MEETING.

We had the pleasure of being present and seeing the 100 or more slides showing the structure of the enamel and the caries of enamel. We may have seen the equal of this exhibition in some other lines, but never before was such an exhibition of the beginning of caries of enamel made in America. We must congratulate the author on his presentment of the predisposing and active causes of decay of enamel, for the lucidity of his description of the steps taken to show this as well as the careful discriminating labor of the preparation, of so many beautiful illustrations involving so much time, knowledge, and care in the work that it may be considered second to none in its vastness. You will see when the paper is published how complete it is.

A. W. H.

In reply to a question we get the following:

Have you used "solila" gold? Yes sir, and I have also seen fillings made from this gold from the hand of expert operators, the surfaces of all the fillings were pitted. A German dentist tells the same story in a German dental journal, from fillings made by Dr. De Trey himself, but I have seen some very large contour fillings inserted five years ago from Dr. W. Sauer, with Herbst foil and I must say they are the most beautiful and perfect work I have ever seen. Since two months I am using this foil and am well satisfied. It is very "sticky," especially No. 3-6OF. I think it would be a great benefit to the readers of the REVIEW if such questions should appear more frequently and also be answered. Let me also state that I consider the removable crown and bridge work of Dr. Flickinger as a great improvement in our profession.

AN OLD READER OF THE DENTAL REVIEW.

CHICAGO DENTAL SOCIETY.

The Chicago Dental Society will celebrate its thirty-third anniversary Monday and Tuesday, February 1 and 2, 1897, by giving a clinic with about twenty-five operators, each morning from 9 to 12 o'clock A. M. Papers will be read Monday afternoon and evening and Tuesday afternoon, closing the exercises with a dinner at 6:30 P. M. Members of the profession are cordially invited to be present. Headquarters for visitors will be at the Palmer House where special rates may be obtained.

This will be the first attempt since the World's Fair on the part of Chicago dentists to entertain their friends and they hope to have a large attendance.

Full programs will be issued about January 15, giving the location of clinic rooms, etc.

Clinic Committee: E. D. Swain, J. W. Wassall, Louis Ottofy, D. M. Cattell, A. W. Harlan, Chairman, 1000 Masonic Temple.

LOUIS OTTOFY,
President.

A. H. PECK,
Secretary.

THE ST. LOUIS DENTAL SOCIETY, OFFICERS FOR 1897.

President, John H. Kennerly; Vice President, P. H. Eisloeffel; Corresponding Secretary, John G. Harper; Recording Secretary, C. C. Cowderly; Treasurer, A. J. Prosser; Committee on Ethics, J. G. Pfaff, J. P. Harper, Wm. Conrad; Committee on Publication, F. F. Fletcher, W. M. Bartlett, De. C. Lindsley.

REPORT OF THE COMMITTEE ON NATIONAL DENTAL MUSEUM AND LIBRARY.

To the American Dental Association :

The thirty-fifth annual meeting of the American Dental Association, by invitation and in line with precedents of other national associations of specialists, formally recognized the Army Medical Museum and Library as the National Museum and Library of the Dental Profession of the United States, and appointed the undersigned a committee to coöperate with the officer in charge of this institution "in enriching its stores of dental literature and museum specimens."

Your committee assumed the duties imposed, conscious of its own insufficiency for a work of such magnitude and vital importance. As we have labored to foster a loyal support of this cause and to promote an active effort for its advancement, we have become greatly impressed, as any one must who gives special attention to the matter, with the immense value of the opportunity herein afforded the dental profession to accomplish essential objects otherwise impossible of attainment. Never was there opportunity more freely offered a profession to demonstrate its value, to acquire a higher rank among the learned callings, to acquaint the professions and the general public with its achievements, and to secure the preservation, classification, exhibition and facilities for the study of all things pertaining to it of present or future historical and educational value. It would be with great loss of prestige and altogether inconsistent with the general course and progressive spirit of the dental profession if we fail to utilize equally with other specialists, and the general physicians and surgeons of the country, the immeasurable advantages of this institution, covering as it does, within a building erected and maintained by the government for the purpose, all available matters pertaining to every branch of medicine and surgery.

The museum, in several respects the rarest of its kind extant, contains more than 35,000 specimens, and, like the library, is open to the public—the intellectual property of all professions and classes.

Its dental section may be made its most attractive department and the greatest object lesson of its kind in the world, if the efforts of the management are met with a corresponding interest on the part of dentists. Dr. D. L. Huntington, Deputy Surgeon-General, the chief officer of this institution, to whom this committee is indebted for especial courtesy, has shown the most gratifying interest and encouraging effort in the development of the dental section. He has recently acquired by purchase a number of valuable and beautifully mounted specimens, most of which are rare. He also proposes to transfer to the dental section such objects as are of special interest to dentists, which are now classified in other sections or distributed through the large general collection. This will enrich our section with specimens illustrating the effect of various diseases on the maxillary bones and the teeth, and with many other valuable objects which dentists could never acquire from their own resources.

The number of accessions, so far, directly from the efforts of this committee is small—perhaps one hundred. We are pleased, however, to report such evidence of interest on the part of individuals with whom we have corresponded as warrant the expectation of contributions of the kind especially needed, namely: series of models, apparatus, drawings, etc., illustrating various operations, methods of treatment and their results. We also hope the leading college faculties will fully illustrate their methods of training, and otherwise utilize this institution to impart a knowledge of the extent and character of college studies and of the nature and import of the subjects taught. We are also greatly encouraged by the fact that quite a number of State and local societies have given heed to the action of the A. D. A., several formally endorsing its action in the premise and appointing committees auxiliary to this committee. The societies so acting are the State societies of North Carolina, South Carolina, Maryland, District of Columbia, New Jersey, Pennsylvania, Tennessee and Mississippi, and the Valley Dental Society, a section of the Massachusetts State Society. From this, large visible results are certain to follow soon.

It is impossible to detail the kind of specimens desired. It is safe to say, however, that anything illustrative of any part of the subject of dentistry, or which would, alone or in connection with other specimens, throw light on the etiology, pathology or treatment of the diseases and deformities of the teeth, jaws, etc., would attain a greatly enhanced value by being placed here as parts of a complete collection.

The Army Medical Library is, admittedly throughout the world, the largest and most complete of its kind in existence. It contains three-fourths of the medical literature of the world, and nine-tenths of the medical literature of recent years. There is a constant daily addition to its 120,000 bound volumes, 200,000 pamphlets and 1,200 current periodicals. Its literature is not only greater in volume than the medical literature of either the Library of the British Museum or the National Library of France, but covers a wider field and forms a better practical reference and working collection. The library has acquired by purchase a large and choice collection of literature in English and other languages relating to dentistry. The voluntary contributions of publishers and authors

would permit the money available for the purchase of their works to be used in other directions equally as essential to the purposes of the institution.

It would be impossible to exemplify the utilitarian purposes of such an institution as the Army Medical Museum and Library, or to say in how many ways such a great depository may be made available for the acquirement and dissemination of knowledge. Everything placed there receives and imparts light, and is enhanced in value by association for purposes of contrast and comparison. It affords the only legitimate means of reaching and teaching its many thousands of intelligent visitors and advanced students, who come from the various professions and better classes everywhere to return and impart to others the information acquired.

We commend this interest as worthy the sincere, constant and active support of every member of the dental profession, and declare the broad plans of the institution, the liberal spirit of its officers and the generous appropriations of Congress for its maintenance ample, with the coöperation of the dental profession, for the purpose of placing dentistry on a higher plane and consummating a work of immeasurable historical and educational value.

We respectfully recommend as a feasible plan of continuing the line of work commenced by this committee: First, the appointment of five members of this association as a national committee charged with the duty of promoting the effort to build up a great National Dental Museum and Library; second, that this association recommend the appointment of committees auxiliary to this national committee by each of the local, State and other dental societies in the United States; third, that the sum of one hundred dollars be appropriated, to be used with other donations, for the purpose of defraying necessary expenses of the national committee.

Respectfully submitted,

WMS. DONNALLY, *Chairman*,

H. J. MCKELLOPS,

HENRY W. MORGAN,

J. TAFT.

[Presented to, and adopted by, the American Dental Association, August 4, 1896.]

CLINIC OF THE CHICAGO DENTAL SOCIETY.

You are cordially invited to attend the thirty-third anniversary clinic and meeting of the Chicago Dental Society, to be held in the clinic rooms of the Northwestern University Dental School, corner of Franklin and Madison Streets, and the Chicago College of Dental Surgery, corner of Wood and Harrison Streets, on Monday and Tuesday, February 1 and 2, 1897.

The committee on clinics invites your careful perusal of this program; it probably covers a more extended range of dental operations than is usually possible.

The Palmer House, which is centrally located, has been selected as the headquarters of the society during the meeting. Visitors from outside the city are requested to avail themselves of the selection of a place where all may be together. The following reduced rates have been secured:

American plan, \$2.50 per day and upward.

European plan, \$1.00 per day and upward.

No articles of merchandise, medicaments, etc., will be allowed to be sold in

the clinic rooms. Permission to make exhibits of any kind must first be obtained from the committee on clinics.

Clinicians are requested, as far as possible, to provide themselves with the necessary small appliances. They will find in the clinic rooms the chairs numbered to correspond with the number of their clinic on this program, and each clinician will be supplied with an assistant if desired.

As far as possible, it is advisable that each clinician residing in Chicago, shall provide himself with a suitable case for his clinic, and to notify the chairman of the committee in case of failure, in order that a subject may be provided from the clinical material at the command of the colleges.

Members of the profession are requested to report to the committee on clinics any suitable cases which present themselves in the mouths of dentists or their patients. Also to report probable cases for the two surgical clinics which are listed on condition that suitable cases are provided. Among the many conditions which can be presented for operation or treatment, are: antral disease, hare lip, exsection of the orbital or inferior dental nerves, extensive necrosis of either jaw, cancer of the lip or anything of that nature.

PROGRAM.—Monday morning, February 1, from 9 till 12 o'clock, at the Northwestern University Dental School, corner of Franklin and Madison Streets. (Five blocks walk west from the Palmer House, then one block north.)

1. Dr. E. K. Wedelstaedt, St. Paul, Minn. Mesio-occlusal amalgam filling. Demonstrating the use of cavity measures or instruments for measuring cavities.

2. Dr. John S. Marshall, Chicago, Ill. Surgical clinic.

3. Dr. S. H. Guilford, Philadelphia, Pa. Method of starting a filling outside of the cavity with the aid of matrices.

4. Dr. B. J. Cigrand, Chicago, Illinois. Method of mounting gold-cusps on broken down bicuspsids and molars.

5. Dr. W. C. Wendel, Milwaukee, Wis. A crescent crown.

6. Dr. E. H. Allen Freeport, Ill. Gold filling.

7. Dr. W. G. A. Bonwill, Philadelphia, Pa.

a. The vast use of pink gutta-percha in the successful practice of dentistry.

b. Illustrating and demonstrating some practical points (truths) in the art of filling teeth with amalgam *vs.* so much *so-called* science in dentistry.

8. Dr. L. E. Custer, Dayton, O. The dangers of commercial currents in cataphoresis.

9. Dr. Edmund Noyes, Chicago, Ill. A platina gold incisor corner.

10. Dr. W. R. Clifton, Waco, Tex. Bleaching discolored pulpless teeth with 25 per cent solution of pyrozone by cataphoric application.

11. Dr. L. P. Haskell, Chicago, Ill. Porcelain work.

12. Dr. G. V. I. Brown, Duluth, Minn. Treatment of pyorrhœa alveolaris.

13. Dr. W. H. Taggart, Chicago, Ill. Carving porcelain.

14. Dr. G. H. Wilson, Cleveland, O. Staining porcelain teeth.

15. Dr. B. D. Wikoff, Chicago. Dr. Wikoff will prepare and imbed in plaster of Paris a number of freshly extracted teeth, and visitors to the clinics will be requested to fill roots on the first day in any manner they consider advisable. On the second day the root fillings thus made will be exposed to view.

16. Dr. E. H. Angle, St. Louis, Mo. Regulating appliances and their adjustment.

17. Dr. J. Austin Dunn, Chicago, Ill. Guides to the entrance of root canals in the bicuspid and molars in difficult cases.

18. Dr. W. E. Griswold, Denver, Colo. New means for support for partial plates, and a gold filling inserted in an artificial tooth by means of blowpipe.

19. Dr. R. G. Richter, Milwaukee, Wis. Distal cavity in superior second bicuspid or first molar. Using soft foil and matrix, cohesive foil finish.

20. Dr. W. W. Walker, New York, N. Y. The immediate separation of teeth.

21. Dr. Frank Abbott, New York, N. Y. The opening, treating and immediate filling of pulpless teeth.

22. Dr. A. H. Peck, Chicago, Ill. A special point in root filling.

23. Dr. L. W. Lyon, St. Paul, Minn. A satisfactory amalgam filling.

24. Dr. C. E. Esterly, Lawrence, Kan. Porcelain crown with band. A new method.

25. Dr. C. P. Pruyn, Chicago. Treatment of alveolar abscess.

26. Drs. F. B. Noyes and William G. Stearns, Chicago, Ill. Microscopical exhibit.

Monday afternoon, February 1, at 2.30 o'clock, in the main lecture room of the Northwestern University Dental School, corner of Franklin and Madison Streets (six squares walk from the Palmer House.)

1. Address: "Recent improvements in filling teeth," by Dr. G. V. Black, Jacksonville, Ill.

2. Paper: "Sensitive Dentine," by Dr. G. F. Cheney, St. Johnsbury, Vt.

Monday evening, February 1, at 8 o'clock, at the same place.

1. Paper: "Heredity," by Dr. T. L. James, Fairfield, Iowa.

2. Paper; "Peculiar Pathological Perceptions," by Dr. J. D. Patterson, Kansas City, Mo.

3. Report: "Three Pathological Cases," by Dr. I. P. Wilson, Burlington, Iowa.

Tuesday morning, February 2, from 9 till 12 o'clock, at the Chicago College of Dental Surgery, corner of Wood and Harrison Streets (from the Palmer House walk one block south to the corner of State and Adams Streets, and take Harrison Street car which passes the doors of the college building.

27. Dr. J. B. Monfort, Fairfield, Iowa. A method of replacing a broken facing on a bridge or Richmond crown.

28. Dr. Chas. W. Jones, St. Paul, Minn. Cataphoresis.

29. Dr. T. W. Brophy, Chicago, Ill. Exhibition of surgical cases, and surgical clinic.

30. Dr. J. E. Cravens, Indianapolis, Ind. Treatment of pyorrhœa alveolaris.

31. Dr. A. O. Hunt, Chicago, Ill. Practical exhibition of facial restoration by artificial dentures.

32. Dr. M. L. Hanaford, Rockford, Ill. A proximal gold filling in an incisor, using semi- and cohesive gold, and working from under surface.

33. Dr. W. V-B. Ames, Chicago, Ill. The combination of precipitated gold and oxyphosphates.

34. Dr. C. R. Baker, Davenport, Iowa. The articulation of crowns and bridges.

35. Dr. J. Y. Crawford, Nashville, Tenn. Gold filling demonstrating the use of noncohesive gold.

36. Dr. W. W. Moorehead, Aledo, Ill. Anæsthetizing of pulp for immediate removal by cataphoresis.

37. Dr. C. S. Case, Chicago, Ill. Obturators and regulating appliances.

38. Dr. K. B. Davis, Springfield, Ill. Proximal gold filling in bicuspid using Harris' mallet.

39. Dr. J. G. Reid, Chicago, Ill. Root filling.

40. Dr. G. D. Sitherwood, Bloomington, Ill. A suitable equipment for making any kind of crown or bridge, with practical demonstration.

41. Dr. C. N. Johnson, Chicago, Ill. Contour gold filling in upper molar.

42. Dr. R. H. Kimball, Chicago. Gold filling.

43. Dr. H. T. Smith, Cincinnati, O. Proximal filling with plastic gold.

44. Dr. B. D. Wikoff, Chicago, Ill.

a. Porcelain faced crowns, showing successive steps on models.

b. Exhibition of root fillings made February 1.

45. Dr. P. H. Morrison, St. Louis, Mo. Amalgam filling, platina-gold lining.

46. Dr. S. F. Duncan, Joliet, Ill. A method of attaching bridges to anterior teeth without amputation of natural crowns.

47. Dr. C. A. Southwell, Milwaukee, Wis. Mesioöccusal gold filling. electric plugger. Rowan's gold.

48. Dr. F. F. Fletcher, St. Louis, Mo. A method of using porcelain teeth in bridges without tipping grinding surface.

49. Dr. Henry Barnes, Cleveland, O., and Dr. L. P. Bethel, Kent, O. Cataphoric use of silver nitrate in the treatment of chronic alveolar abscess.

50. Dr. J. Prendergast, Chicago, Ill. Microscopical exhibit.

51. Dr. J. H. Woolley, Chicago, Ill. Hot air a failure in desiccating root canals prior to filling. With a demonstration.

52. Dr. W. W. Shryock, Fort Wayne, Ind. Crowning deciduous teeth.

EXHIBITS. 1. By Dr. S. B. Brown,* Fort Wayne, Ind. A metallic oxide known as "enamel restorer." For restoring polished surface on the natural teeth, where the enamel is defective, grind out the superficial defects, smooth the surface with Arkansas stone, then use the enamel restorer, with water and Moose hide point. Ground surfaces on artificial teeth are polished in the same manner.

2. By Dr. W. G. Clark, Cedar Rapids, Iowa. Removable porcelain bridge.

3. By Dr. L. W. Lyon, St. Paul, Minn. Parts of crowns in different stages of construction.

4. By T. G. Wonderly, Galena, Ill. Sectional impression cups.

5. Dr. G. W. Schwartz, Chicago. Full upper porcelain bridge.

6. Dr. G. V. Black, Jacksonville, Ill. Office conveniences.

7. Dr. C. N. Trompen, Chicago, Ill. Appliance for holding back the rubber dam at the angle of the mouth during operations.

8. Dr. T. D. Shumway, Plymouth, Mass. Gold and tin combination gold filling, showing method of union of the two metals.

* Deceased.

Tuesday, February 2, at 12 o'clock, noon, in the lecture room of the Chicago College of Dental Surgery:

1. Paper: "A Basis for a Code of Honor Among Dentists Everywhere" By W. G. A. Bonwill, Philadelphia, Pa.

Tuesday evening, February 2, at 6:30 o'clock. Annual dinner in the banquet room of the Palmer House.

Committee on Clinics.—A. W. Harlan, Chairman, 1000 Masonic Temple, Chicago; E. D. Swain, J. W. Wassall, Louis Ottofy, D. M. Cattell.

OBITUARY.

DR. JAMES A. SWASEY.

The death of Dr. Swasey on the morning of December 26 was a sudden and unexpected surprise to his many friends in and out of the profession. He had been complaining for some time of a difficulty in breathing and also of some stomach troubles, but it was not thought by many of his friends that the end was so near. Dr. Swasey was nearly sixty-four years of age. The following is taken from the *Chicago Evening Post* of December 26:

"Dr. James Atwood Swasey, one of the best known dentists of Chicago, died at his residence, 3017 Michigan Avenue, to-day. No arrangements for the funeral have been made known by the family.

"The deceased came to Chicago in 1869, and opened an office in the Shepard block, Monroe and Dearborn Streets. He was among the many who lost their possessions in the great fire of 1871. But since that misfortune Dr. Swasey has occupied a high place in local dentistry. He was president of the Chicago College of Dental Surgery for several successive terms, and was also an instructor in that institution. He was widely known also as a member of the American Dental Association, the Illinois State Society and the City Dental Society. He was born at North Danville, Caledonia County, Vt., March 12, 1833, and attended the district schools at that place. Subsequently for two years he was a student at Phillips Academy, Danville. After leaving the academy he went on an extended hunting trip with friends, remaining in the woods of Indiana eighteen months. With health and vigor, he determined upon following the profession of dentistry. In the office of O. S. Swasey, M. D., of Beverly, Mass., the doctor first

began his studies in dental surgery. Subsequently, Dr. Swasey practiced five years in Ipswich, Mass., and four years in Gloucester, Mass. In May, 1862, he was married to Miss Tuck, of Beverly, Mass. Dr. Swasey was the inventor of some very useful and practical apparatus for dentists' use and was considered in the front rank of expert dental surgeons."

Dr. Swasey was a man of commanding presence and strictest integrity, a warm friend and an enthusiast in his profession. Early in 1892 he lost his only son, a young man of much promise, (a recent graduate of the Chicago College of Dental Surgery) from that date he had never regained his usual vivacity of spirits and seemed to have lost much of his previous interest in dental societies. During these latter years he had spent a considerable portion of his time on a small farm in Michigan with his favorite horses. Practice no longer possessed that charm for him that it had when his son was alive. He was buried in Massachusetts by the side of the son whom he mourned to the last. He leaves a widow but no children. Those who knew him most intimately respected him and loved him for the good qualities they knew him to possess. He was so genial and kindly in all his intercourse with them that he was always like an elder brother. His mind knew not envy nor malice and he would scorn the thought of being unjust to any one. He had a towering intellect, a broad comprehension of the works of others. He would fight to the last for a principle and in the struggles for an honored name for his profession as a profession, he was always to be found among the active partisans. We mourn his loss as that of a dear personal friend and extend to his bereaved wife our tenderest sympathies.

RESOLUTIONS ADOPTED BY CHICAGO DENTAL SOCIETY.

We are called upon to mourn the death of one whose face will no longer be seen in our midst, Dr. James Atwood Swasey, for many years an active member of this society.

This sad event occurred early in the morning of December 24, at his residence, 3017 Michigan Avenue, Chicago.

Dr. Swasey had been in his usual good health up to about the middle of November, when he first noticed that he was suddenly breaking, and for a few days he went to the West Baden Springs; but not finding the desired relief, he returned to his summer home in Michigan, and from thence came to Chicago where he died surrounded by his family and friends.

Dr. Swasey was the President of this society when the twenty-fifth anniversary was celebrated in 1889. He was President of the Odontological Society of Chicago in 1894-5, a member of the Illinois State Dental Society, the American Dental Association, and a member of the first International Dental Congress, Paris, France, 1889. He was also the first president of the Chicago College of Dental Surgery, and was reelected for several years. He was an honorary member of several dental societies, State and local, in the United States.

The society loses one of its best representatives in the death of Dr. Swasey.

He was a man of strong character, high minded and generous, with a pleasing manner, modest in his estimate of his own acquirements, ever ready to counsel and assist others.

He was a firm friend, a strong partisan, energetic and industrious, an inventor of many useful appliances and devoted to his profession to the last.

We will miss his familiar face, and hearty grasp of the hand, in all of our subsequent sessions.

We mourn with his family in this their hour of affliction, and extend our sympathies.

We place these lines of respect to his memory in our permanent records, with the thought that his life had been useful to the community where he had resided for so many years, and with the ever present hope and belief in the immortality of his spirit forever and forever.

Be it resolved that a copy of this tribute be sent to his family, and others to the dental journals for publication.

A. W. HARLAN,
TRUMAN W. BROPHY,
F. H. GARDINER,
Committee.

DR. S. B. BROWN.

Dr. Brown died January 5, 1897, at his home in Fort Wayne, Ind., surrounded by his family and friends. We clip the following sketch of his life from a Fort Wayne paper:

"Seneca Buel Brown, M. D., D. D. S., was born August 11, 1834, at Marlboro, Windham county, Vt. His father, John Brown, was born at the city of Rochester, county Kent, England, August

28, 1787, and came to America and located at Rutland, Vt., in 1820. He married a daughter of Archelaus Dean, a native of Massachusetts, of Puritan ancestry, who served through the revolutionary war and died in Vermont, in 1846. She was born at Brattleboro March 19, 1799, and died at Marlboro, Vt., September 30, 1877. She was a member of the Baptist church. John Brown, who was a member of the Church of England, and in politics a free-soil democrat, died at Westminster, Vt., March 3, 1851. To the latter town the family removed when Dr. Brown was four years of age. Here farm life occupied him until 1852. In the meantime, the district school and three terms at Westminster seminary completed his education. November 1, 1852, he entered the office of Oramel R. Post, D. D. S., at Brattleboro, Vt., as a student of dentistry, and on January 1, 1854, began practice at Ticonderoga, N. Y., on a circuit including Ticonderoga, Westport, Essex, Elizabethtown and Schroon lake, in Essex, and Chestertown in Warren county. He came West and located at Piqua, Ohio, October 23, 1855, and there, on June 9, 1864, he was married to Nannie Louise, eldest daughter of the Hon. Stephen Johnson, of that city. July 6, 1874, nine years after their removal to this city, Mrs. Brown died leaving an only child, Katie, then seven years of age. February 14, 1888, he was married to Minnie Russel Graves, oldest daughter of Charles E. Graves, of this city, who survives him. Dr. Brown came to Fort Wayne May 3, 1865, when the population of the city was 15,000, and at the time of his illness was the only resident dentist who was practicing in his own name in this city in 1865. Dr. Brown received the degree of doctor of dental surgery from the Pennsylvania Dental College March, 1870; was elected secretary of the Indiana Dental Association June 29, 1869; received the degree of doctor of dental surgery from the Ohio College of Dental Surgery March 1, 1871; was elected president of the Mississippi Valley Dental Association, the oldest in the world now in existence, March 6, 1884; was elected a member of the board of Indiana dental examiners June 29, 1880, holding the office seven years; was elected president of the Indiana State Dental Association July 1, 1885, and a member of the board of trustees of Indiana Dental College March 3, 1886; received the honorary degree of doctor of medicine from the Fort Wayne College of Medicine March 6, 1888, and March 6, 1889, was elected president of the Indiana Dental College. For over twenty-five years he has

been a member of both the American and Indiana State Dental associations. Dr. Brown's eminent skill in his profession and his high personal character were the commanding influences which won for him an extensive clientage and a satisfactory mien of success. In politics Dr. Brown was a staunch believer in the principles of the republican party. He was the first president of the Fort Wayne colony of the American Sons of the Revolution and took an active interest in that society."

WILLIAM NEWTON MORRISON, D. D. S.

A special meeting of the St. Louis Dental Society was held on December 23, 1896. President F. F. Fletcher opened the meeting with the following remarks:

Members of the St. Louis Dental Society: It was with heavy hearts that your officers sent notice to meet here in special session to-night. As lightning from a clear sky came the news to us yesterday morning, that one of our oldest, most respected and esteemed members lay cold in death.

A man who but one short week ago sat in his place in the councils of this body and took part in the deliberations, and whom we had every reason to hope and expect would meet with us for years and aid us with his council and advice.

A man known and respected wherever dentistry is practiced. He was a careful student, a ripe scholar and an inventor of much ability.

Few men in our profession have been more progressive or lived to see their experimental work in untried fields adopted and approved by all. He was a pioneer in crown work, bridge work and implantation. They stand to-day his most lasting monument.

But he is gone. The last page of his life is before us.

My friends, in the death of William N. Morrison the dental world loses one of its pioneer and brightest stars. This society has lost one of its ablest men and most staunch supporters.

Every member has lost a friend whose place will not easily be filled. May no uncharitable word be spoken, but as we say peace to his ashes may his memory ever be kept green by the greatness of his achievements.

Appropriate remarks were made by Drs. H. J. McKellops, G. A. Bowman, J. H. Kennerly and Wm. Conrad.

The following committee, Drs. H. J. McKellops, John G. Harper and A. H. Fuller, was appointed to prepare a biographical sketch of Dr. Morrison. The committee on January 5, 1897, presented this report:

BIOGRAPHICAL.

William Newton Morrison, D. D. S., born in East Springfield, Ohio, May 25, 1842, died in Hot Springs, Ark., December 20, 1896.

He was one of thirteen children of John R. Morrison, those surviving are James B., Mrs. Lane, of Kansas City, Mo., and Mrs. Cook, Mendota, Ill.

Dr. Morrison's early education was but meager, obtained in the common schools. He worked in his father's saw mill while at home, but left in 1858, came to St. Louis to become a student of his brother James B., the inventor of the Morrison dental engine and chair.

He arrived at his brother's office penniless, having spent his last money to have his boots blackened and his clothes brushed so as to make a presentable appearance. The brothers kept bachelor's hall in the same building occupied as an office.

James B. went to Europe in 1862 and William then took charge of Dr. H. J. McKellop's office, who also left the city about that time.

In 1864 he graduated from the Ohio Dental College.

In 1868 he and Miss Cornelia Holme, of Hannibal, Mo., were married, two sons were added to the family, Peter Holme and William N., the former is married and has a son two years old.

The doctor was so successful in his early practice as to be able in 1872 to build at 1401 Washington Ave. a house which combines a dwelling and a dental office, each complete for the purpose intended; the plans being made by the doctor and published with illustrations in the *Missouri Dental Journal*.

Dr. Morrison belonged to a family of dentists, having an uncle, two brothers and two cousins who followed that profession.

As a dentist Dr. Morrison kept abreast of the profession and was one of the first to use the mallet and to construct gold crowns.

He was one of the first to revive the "planting" of teeth, as he called it, his first cases being reported in 1874, the last report was made at the last meeting of the St. Louis Dental Society he attended on December 1, 1896.

He was fond of visiting the offices of dentists and when in a town or city made it a rule to call on the members of the profession there located, to learn what he could and cheerfully give to others ideas which he thought might interest or benefit them, he always took pleasure in entertaining dentists of the city and those from abroad.

He became a Mason in 1865; he was brought up a Methodist, but after marrying, joined the Presbyterian church, belonging to the Second.

Dr. Morrison was a constant attendant of dental societies and belonged to the American, Southern, Illinois, Missouri and St. Louis; frequently writing papers, giving clinics and joining in the discussions, also holding office, in those of which he was an active member, having been president of the Missouri and St. Louis—twice of the latter. He took an active part in the Missouri Dental College, filling the chair of mechanical dentistry, also acted as demonstrator, and gave clinics at every session when in the city.

Dr. Morrison traveled extensively for a dentist. July, 1878, he started on a trip around the world which consumed about a year, while on this trip he learned all he could regarding the status of the profession in the countries visited, bringing home with him specimens of work found while abroad, he also made a large collection of photographs of places visited, these he frequently publicly exhibited in the aid of charity. In 1890, he took a trip to Germany for his health, again in 1894 accompanied by his wife he made a trip to Europe. He has been to the West Indies, and also traveled extensively in this country.

Dr. Morrison was a writer for our journals and many of his articles and items are to be found in the *Missouri Dental Journal* and its successor, the *Archives of Dentistry*, both of which he aided in more ways than one. Of the former he was one of the editors of the department of mechanical dentistry for four years.

Dr. Morrison was a public spirited citizen and did his share for the public good. He, at his own expense, placed numbers of the streets on Washington Ave., from Jefferson Ave. to King's Highway.

Dr. Morrison was as well known and esteemed in this country and abroad as any dentist in our city. He was the inventor of the Morrison dental bracket, being one of the first on the market.

Dr. Morrison made friends wherever he went, and none ever heard him say aught against any one.

His success was gained by hard faithful work, and he was ever ready to lend a helping hand to his fellow men.

H. J. MCKELLOPS,	} Committee.
JOHN G. HARPER,	
A. H. FULLER.	

THE DENTAL REVIEW.

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No. 2

ORIGINAL COMMUNICATIONS.

RECENT IMPROVEMENTS IN FILLING TEETH.

By G. V. BLACK, M. D., D. D. S., Sc. D., JACKSONVILLE, ILL.

Gentlemen: We are gathered here to-day to celebrate the thirty-third anniversary of the Chicago Dental Society in a great clinic. Many of you have left your homes and your practices to be with us and assist us by your presence, and also to enter into the clinical work. To you, brethren, from beyond the limits of the city, Chicago extends the hand of good-fellowship and a most heartfelt greeting. We have greatly desired your presence, and while we shall enjoy your sojourn with us we will be but too glad to know that you may have pleasure in friendships renewed and new friendships formed. We wish you to see what we are doing in our offices; what we are accomplishing, and how, and to receive your friendly criticism and advice. We wish you to see what we are doing in our several dental schools; what we are teaching, and how we are teaching; and learn from your commendations to retain the best, and from your condemnations how to mend our ways of work for the future; hoping meanwhile that you will also find in your review of these matters much that will be of interest to you, and that when you part from us to return to your homes it will be with the feeling that it has been good for you that you have been here. We have also wished to see you socially, to meet you as men, to shake your hand and spend the hours of remission from sterner duties in good social chat. Indeed, from every side we bid you welcome.

The immediate and ostensible object of our coming together

is the clinic, and it is with the clinic especially that I am expected to deal in what I shall say to you to-day. Much might possibly be said as to the general management of clinics for the development of the greatest amount of good, but that I shall pass over and confine myself for the most part to the more recent developments in filling teeth.

Possibly if each man here were asked to state what he regarded as the most important recent development in filling teeth we would receive many and varied answers. These answers would be divisible into two great classes that would reflect in a degree the peculiar mental bent of those giving them. The one class would represent the mechanical technique of filling operations, while the other would represent the mental grasp of the principles of the application of this technique.

Can we justly thus divide these—the technique and the principles of the application of the technique? Can we give the one precedence over the other? Certainly not; and yet the constitution of human minds is such that the one man is the more strongly impressed and thus drawn to the one, while another is more strongly impressed with and drawn to the consideration of the other. It is especially fitting that these two classes of minds should rub against each other in a clinic like this. In so doing each will be influenced to better effort and a higher appreciation of the justly intimate blending of the two that is required for gaining the highest results in dental operations.

Filling teeth has grown to its present high state of utility by very gradual accretion of thought upon thought in basic principles, and the steady march forward of manipulative technique for the realization of each accretion of thought. As it has thus advanced in the past, so it will steadily advance in the future; a little being added here, a little there, each little that experience proves to be good being cemented into its proper position in the sum of the best procedures of the time.

Most that I shall say to-day will relate to recent advance in what may be termed basic principles of the application of technique. To many of you I may not be able to offer anything that is new. Indeed, it is my intention to discuss rather that which has been some time known but has not been known long enough for a full realization of its true bearing upon the everyday operations in filling teeth. It often happens that important principles

may be known to the individual in a kind of semi-conscious way without leaving their impress upon his operations, and for this reason discussion of them time and again is necessary to their thorough diffusion through the profession at large, and especially for the appreciation of their just importance as working principles.

I will call your attention to the study of the anatomical relations of the teeth to each other and to the immediate surrounding soft parts. To the physical characters of the teeth themselves and their ability to withstand stress. To the nature of caries and to its causation, a subject upon which demonstrated knowledge has very recently been gained, and try to point out the relation of these to everyday procedures in filling teeth.

I have not the intention of discussing these matters in detail, but wish to call your attention strongly to certain points which bear an intimate relation to the improvement of filling operations.

The teeth as they stand in the mouth in normal position form an unbroken arch by their proximate surfaces resting against each other. Now it is to the nature of this contact of tooth against tooth in its relation to the soft tissues that I wish to first direct your attention, not as a new point, for others as well as myself have discussed it before, but rather to point out anew and for further discussion its intrinsic relation to technical procedures for the arrest of caries and the protection of the related soft parts. In the well-formed dental arch this contact of the teeth the one with the other is similar to the contact of two marbles when brought together. So long as they have not been flattened by wear, the points of contact are very small and easily slide more or less upon each other with the motion of the teeth in their sockets. Immediately to the gingival of this contact the surfaces of the teeth begin to stand apart and the space increases until the alveolar process is reached forming a V shaped space between the tooth surfaces; which in normal conditions is filled with the soft gum tissues. The angle of these V shapes varies indefinitely. This is the interproximate space. This interproximate space also rounds out broadly toward both the buccal and the lingual. These I shall call the buccal and lingual embrasures of the interproximate space. Nature's object and evident intention in the particular form of this space is cleanliness of these surfaces of the teeth. In the chewing of food, hard brittle substances are perfectly deflected from these interproximate spaces by the forms of the surfaces

guarding it (showing model), and it is only when tough, stringy foods are in process of mastication that anything passes the interproximate contact into the interproximate space. Even then such foods do not remain between the contact points, because the marble like form of this contact causes it to slip away in the one direction or the other. It will either slip outward or slip fully into the interproximate space and rest upon the septum of gum tissue. Suppose it slips into the interproximate space and hangs between the teeth. Now it is especially this condition to which I wish to direct your attention. It is the design of the Creator that this event should be prevented or rectified almost immediately after the occurrence, and it should be the design of the dentist in every operation upon the proximate surfaces of teeth. If we go into the study of comparative dental anatomy on this point we will find that such animals as live much upon grain and brittle foods have broad interproximate contacts, while the carnivora that live upon flesh have exceedingly narrow, even pointed contacts that round suddenly and very freely to the buccal and lingual. (Showing teeth of horse and of dog.) The contacts are broad and flat in the horse, while buccal and lingual embrasures are broad and shallow and the contacts very narrow in the dog, thus illustrating the evidence of design.

Now, gentlemen, I commend to you another study in relation to this matter of the interproximate contact, and ask of you that you take it home with you, and study it at your chair while making your operations, and this is the influence of the *excursions of food over the surfaces of the teeth and gums during the act of mastication.* (Illustrating with model.)

If you do this, you will find the natural forms of the teeth of young people (before the contacts are much worn) are such that the food is directed into the lingual and buccal embrasures of the interproximate spaces, and is made to drag against the declivities of the gum septum. *In this act, any stringy material that has lodged in the space is caught by food material, thus dragging it past and carrying it out of the interproximate space.* This is nature's plan of keeping these spaces clean, a plan that is fairly successful in young people before the contact points become flattened by wear.

What is the result if these forms and arrangements fail in the performance of their function? Simply that food is forced in and lodged in the interproximate space. The arch form of the gum

septum is destroyed by the pressure of the lodged material, and a pocket is formed between the teeth in which food habitually lodges and lies to be decomposed by the microörganisms of the mouth. One of two results will certainly follow sooner or later. These surfaces of the teeth will become carious, or disease of the gum tissue slowly extending to the peridental membrane will occur, threatening the usefulness of the teeth from loosening in their sockets.

Now, what will happen if fillings in carious proximate surfaces be made without attention to these points? What has happened in past time? Review our literature, and note expression after expression of the difficulties met with from recurrence of caries after filling proximate surfaces. Our literature is literally filled with these expressions, and especially as affecting the proximate surfaces of the bicuspid and molars. Why has this difficulty so persistently followed the flattening of these surfaces with the file when it has been used for the purpose of gaining room for filling? I answer, because of the unnatural and unhealthful forms given to the proximate surfaces. Why has this difficulty of recurrence of caries so persistently followed the so-called contouring of the teeth with cohesive gold? Again I answer, because of a lack of appreciation of the appropriate and healthful form of the contact and of the interproximate space.

This leads me almost to the point of using unusual intensives in my expression of desire to see a more full appreciation of this point. I am tempted to say that the contouring of teeth is an *ignis-fatuus* that leads to the mire. We should contour the interproximate space. What matter if the tooth form is not perfectly restored? The tooth form should be held secondary to the contouring of the interproximate space. The guarding of this space is the first consideration. The form of the tooth or even its full occlusion is of less importance. Though not to be neglected it should be held as secondary. The health of the tooth and its surrounding tissues is the first consideration from any point of view that may be taken, and to this end the contour of the contact and the space comes first—form and occlusion is the important after-consideration. So long as food wedges between the teeth, causing pain, mastication is ineffective. The patient goes lame at table to say nothing of disease to follow. I have been impelled to speak more at length and more strongly on this point since seeing the

programme of this great clinic—intended to be one of the greatest in the world. While a number propose to illustrate the contouring of teeth, not one has proposed to illustrate the contouring of the interproximate space. Hence my desire to press the point. Not as a new thing, but as a comparatively recent development of basic principle that should impress and give character and additional usefulness to each man's operations. It will not do to claim that the contouring of the tooth includes the proper contouring of the space. That is the wrong standpoint from which to view the matter. Dentists have gone on from decade to decade contouring teeth and failing to properly contour the interproximate space. I beg of you to view this matter from the vantage ground of the best defense against recurrence of caries and the best defense against disease of the soft tissues.

In my practice I no longer hesitate to remove the most perfect filling; otherwise, if I find it failing to protect the interproximate space, provided of course, that I cannot cure the fault without removal. No matter whether I have made the filling or one of my fellow practitioners has made it. I cure this trouble at all hazard; and let me say that there is no operation that I undertake of which I have more thankful expressions of appreciation from patients. Yes, I go still farther. When flattening of the contacts from wear occurs in middle aged people, and they begin to have trouble from lodgment of food, I do not hesitate to cut cavities in perfectly sound teeth and fill. In this operation I avert a threatened danger of serious character, while removing a present inconvenience to the patient.

RELATION OF OPERATIONS UPON PROXIMATE SURFACES TO THE ACTIVE
CAUSES OF CARIES.

In all filling operations upon proximate surfaces, the operator should have a broad mental grasp of the nature of the active cause of caries and its mode of aggressive attack. Very recently demonstrated knowledge of this has been materially advanced by the work of Dr. J. L. Williams, of London. I met Dr. Williams in New York last month and had the opportunity of a long conference with him, together with an examination of his slides, besides hearing his paper before the Odontological Society and seeing his photo-micrographs projected upon the screen. In reference to caries of enamel, and especially as to the methods of attack in the first inception of the carious process, Dr. Williams has furnished

evidence of the most trustworthy and positive character, which adds very materially to demonstrated knowledge. While this knowledge proves not to be very different from what I and others have been teaching for a number of years, it is a demonstration of truth so clear and unmistakable as to constitute new knowledge of the subject of the most important character.

As far back as 1838 Robertson pointed out that caries must be caused by acids produced by decomposition at the immediate point where caries occurs. But Robertson could not explain how these acids were formed. He could only point out that they were certainly formed from noting that their effects were confined to a small portion of tooth surface in positions favoring lodgments and decompositions. It required half a century of study and experimental research before the formation of acids as a product of decompositions by germs was rendered fairly clear by Pasteur. Finally, in 1882 to 1884, Dr. Miller, of Berlin, determined the classes of microorganisms producing caries of the teeth, the character of fermentation produced by them and the particular acid which they formed. The action of this acid upon tooth structure was also determined very accurately and the relation of microorganisms to its production within the dentine clearly shown. But the question as to how the first attacks upon the surface of sound, firm enamel were made was still waiting for clear, definite demonstration.

Dr. Miller has been noncommittal on this point. I have been more definite in statement in some lectures before the Illinois State Dental Society, in which cultures for demonstration were made, and to my classes, but have always fell short of actual demonstration that would give the weight and influence actual certainty. I have shown that under some conditions microorganisms formed into a film or layer agglutinated together upon the surfaces of the teeth in secluded or partially secluded positions and formed their acid products in immediate contact with the enamel where it was definitely protected from being washed away by the saliva and thus left free to exert its decalcifying power on that tissue. I have shown the formation of this agglutinating substance in artificial cultures, as many here to-day will remember.

Now, Dr. Williams has found the means of showing all of this as it occurs under natural conditions in the human mouth, together with the immediate effects upon the enamel. By the use of cer-

tain hardening fluids he has devised, this film of microorganisms in the gelatinous matrix formed by them has been rendered sufficiently hard to be ground down upon a stone with the enamel to which it clings, forming sections so thin that both the microorganisms and the enamel rods come clearly into view, together with the immediate effects upon the enamel tissue. This effect of the acid products of the microorganisms is much like that which has been described by myself from other modes of examination. That is, it is found to consist in the first instance in the solution of the cement substance by which the enamel rods are held together, and finally the much slower solution of the rods themselves and the gradual breaking up of the tissue.

But Dr. Williams' demonstration shows a power of penetration of the acid products of microorganisms when covered in by these films upon tooth surfaces, for which I was wholly unprepared. Among his ground specimens there are several showing the penetration of the entire thickness of the enamel and a spreading of the effect well into the dentine without the displacement of a single enamel prism. An exploring instrument might be passed over the surface of the enamel without the detection of any break in the continuity of the surface, and yet the sections show beyond the possibility of mistake widespread softening of the tissue. The extent of this was to me the point which particularly arrested my attention. The effect in the enamel was distinctly the solution of the cement substance between the rods causing these rods to stand distinctly apart; in some the whole thickness was thus affected before any rods fell away, and in others the surface ends of the rods had begun to be broken up before the whole thickness of the enamel had been penetrated. In still others only the outer portion of the enamel had been affected, and over these outer ends of the rods was the film of agglutinated microorganisms, covering it all in and effectually preventing the dissipation by saliva currents in the mouth of the acid formed.

It was curious to note how this effect was confined to portions of enamel the surface of which is covered by the film of microorganisms. So constant is this that Dr. Williams is of the opinion that the beginnings of caries occurs in no other way. In other words acid saliva has no influence in causing the beginning of caries. Acids distributed in the saliva have no influence in causing caries. It is solely acids produced beneath these films of

microorganisms and protected from dissipation into the saliva by these films that is responsible for the beginnings of caries. After a breach is once established and a haven formed for the protection of growths of microorganisms, or after the penetration of the organisms into the tissues of the tooth, the carious process is not only assured but is more rapid. All of that has been sufficiently demonstrated by Dr. Miller and has become well known.

The application of this to the management of proximate surface fillings is now the important consideration. This means cleanliness of surfaces for the purpose of prevention of recurrence of decay. How can this be effected in the highest degree? We have been unable to effect this by means of antiseptic washes or artificial cleaning. The danger line is found to extend to the portions of tooth surfaces lying well in the buccal and lingual embrasures of the interproximate space (illustrating), where they fail to be regularly cleaned by the excursions of food during mastication. The portions of the proximate surface replaced by the gold filling is safe from caries, for the reason that the gold is not acted upon, but the cavity margins constitute a line of danger. Therefore, in the formation of the cavity for filling, cut to the buccal and to the lingual sufficiently to place the line of margin in position to be habitually cleaned by the scrubbing caused by the excursions of food during mastication. This is essentially what I have in a previous paper before the Illinois State Dental Society, and in the articles in the *Cosmos* of 1891, denominated *extension for prevention*.

Of course, there will be failures from imperfect manipulation and other causes. But the application of these principles, carried out by a steady hand trained to a high degree of skill in the present technique of filling operations, will give the operator few causes for chagrin in the way of recurrence of caries of the proximate surfaces.

Dr. Williams also brings us important data with reference to the comparative liability of classes of teeth to caries, and of the influence of imperfect formation of enamel upon the liability of teeth to succumb to the carious process. In this study he seems to have recognized, as most others have done, that roughness or irregularities of surfaces, pits, deep grooves, and fissures give opportunity for caries by furnishing convenient points of lodgment of microorganisms. But Dr. Williams seems to have been led to

the conclusion that beyond this, the conditions which determine attacks by caries is something apart from the teeth themselves. The predisposing cause is not found in the teeth, but in their environment. It is not in the composition or condition of tooth structure. On this point Dr. Williams seems to have worked long, earnestly, and very voluminously, and without any knowledge whatever of my own work in that direction. The plans of his work were also entirely different from my own. In this work Dr. Williams has obtained teeth fresh from the mouth with the history of the patient as to caries or immunity from caries, and made microscopic examination of the enamel of these teeth to determine the degree of perfection or imperfection of structure. These examinations have given very striking results. In order to appreciate this, you should know that Dr. Williams has become remarkably skillful in grinding sections of enamel. So skillful that he seems able to reduce it to the thickness of a single layer of enamel rods, and yet preserve the section intact, a skill that has been attained only by long and careful technical study. He has therefore been able to study the structure very minutely. In this mode of study, that which he regards as the highest type of perfection of enamel is not found continuously. Indeed, most specimens are found faulty in some particulars. The most persistent imperfection is what Dr. Williams regards as a partial failure of the cement substance which unites the rods together. This is in the quality of the material, or, in some instances, apparently an insufficient amount of it, so that the union of the rods remains in some degree imperfect. This latter produces the white spots often seen in enamel.

In the study of teeth carious and teeth not carious Dr. Williams seems to have been struck with the fact that the carious teeth were not necessarily those of imperfect enamel. Indeed, after studying some hundreds of cases the conclusion reached is that this factor has no practical relation to the occurrence or non-occurrence of caries. He finds the most perfect enamel will not withstand the attacks of microorganisms once a solid film is formed upon its surface, while the least perfect is not attacked without the presence of such a protecting film. In support of this he cites instances of complete immunity from caries in which teeth have been lost from disease of the peridental membrane from the age of thirty-six to about sixty in which the enamel of the teeth proved to be of very inferior quality, while many teeth from

persons suffering badly from caries the enamel was of the best quality. In following out this subject the teeth of many animals never known to suffer from caries have been examined and the enamel of those have been found generally less perfect than the enamel of the teeth of man.

After this exhaustive study of the conditions of the occurrence of caries, a study occupying more than ten years of continuous research, Dr. Williams arrives at a conclusion which seems to be the same in effect as my own conclusions obtained by totally different methods published in the *Cosmos* in 1895. These conclusions have been found by each independently and each without a knowledge of the work of the other. Dr. Williams and myself had held no correspondence nor seen each other for eleven years when I met him in New York.

These conclusions are substantially: That the structure of the teeth is not a factor in their liability to caries, further than that pits, grooves, fissures and roughness of surfaces gives opportunity by inviting lodgments and facilitating the growth of microorganisms at particular points. That the predisposition to caries is to be found in the environment of the teeth. That this predisposition is some condition of the secretions or fluids of the mouth which renders the active cause of caries (microorganisms) effective in its production.

The question of hard teeth and soft teeth has been found to have no relation whatever to the occurrence of caries. The hardest teeth and those with the most perfect enamel seem as likely to become carious as those less dense and less perfect in the structure of the enamel.

These conclusions have no reference to whether or not teeth with imperfect enamel or of least dense structure will decay more rapidly when the predisposition to caries is present, but it has been noted particularly that teeth with the most perfect enamel and of the densest structure decay very rapidly when the predisposition to caries has rendered the exciting cause active.

In all of those cases in which the teeth seem to have improved in quality or depreciated in quality, the change of condition has not been in the teeth themselves, but a change has occurred in their environment—in the secretions and fluids which has affected the active agents producing caries in the one case tending to immunity, and in the other increasing its activity.

The particular conditions of the secretions constituting a predisposition to caries or inducing immunity from caries is as yet unknown.

These considerations and conclusions are of the utmost importance in filling operations. We have the assurance that however soft teeth may appear to cutting instruments they have sufficient strength for any reasonable filling operations. Whenever the predisposition to caries is found to be strong this fact calls for the exercise of the utmost diligence and care in planning the defense of the teeth; and especially of laying out the lines of the enamel margins of cavities in such positions that they will be well cleaned by the excursions of food over them during mastication. For this purpose the buccal and lingual enamel margins of proximate surfaces should be carried well out from the contact point and the form of the occlusal surface so shaped as to direct the excursions of food well into the buccal and lingual embrasures of the interproximate space to facilitate the continuous cleaning of these margins. Such portions of the enamel margins of proximate surfaces as cannot be so laid as to receive this natural cleaning, as the gingival margins, should be so placed as to be protected by the free margins of the gums. The fact that caries does not begin upon the portion of the necks of the teeth covered by the healthy free margins of the gum seems to me to be well established by observation, but it does begin in such position in some of the pathological conditions of the gum margin, and is often found to make its beginnings close against the gingival line when the proper guards of the interproximate space have been destroyed, either by extraordinary wear or by mutilation, at the hands of the dentist. The reasons calling for this especial care are: first, all portions of proximate surfaces lying within the interproximate spaces are in especial danger when the predisposition to caries is strong. This danger area includes the breadth not cleaned by the excursions of food or not covered by healthy gum tissue. If this danger area is cut away at once and protected by the filling, the opportunity for recurrence is removed. Second, with the best technique of our time the margins of fillings must still be regarded as danger lines, and in all cases of unusual, or even ordinary intensity of predisposition to caries should be so laid as to receive the best possible cleaning by the excursions of food during mastication or be protected by healthy gum margins. The opportunity for the growth

of films of microörganisms upon the lines of the enamel margins should be reduced to the lowest possible point. In laying these plans it must not be overlooked that the seating of the filling must be sufficiently broad and flat that the filling may easily bear the great stress that may come upon it. No fear need be felt for the strength of the tissue of the tooth, for whether gold or amalgam be chosen, the filling material not the tooth structure will be first to yield to stress. When these points are skillfully observed and the mechanical technique is carried out with a careful hand well skilled in the art as known to-day, not many cases will return chagrin to the operator.

Further, intensity of predisposition to caries is not constant. This condition is most likely to occur in youth, and when treated with vigorous care will materially abate in 95 per cent of cases, while not a few become wholly immune. Some of my patients of twenty to twenty-five years ago, who then in their youth presented intense predisposition to caries, became immune later and have presented but slight relapses. Among those who have remained under my observation caries has not remained continuously active in a dozen cases. These facts should give courage in the grapple with these ugly cases. It should call out our best effort. Should bring into play the highest form of mechanical technique with best of material—so far as may be at all practicable (we cannot always use it) it should be gold, and gold only. What we may be able to do with improved amalgams in the future remains for test of trial. My experience with amalgam in the past condemns it in all cases when the predisposition to caries is intense, and generally for young people. In the few cavities occurring in cases of low intensity of the predisposition to caries any tyro may succeed. It is the bad cases that calls for wise planning and skillful technique.

And now, gentlemen, I place these matters before you for your consideration and discussion, hoping that you will speak your mind without reserve or hesitation, remembering only that you are speaking for the benefit of humanity; that you are speaking to the end that dentists may serve suffering men with more zeal, greater wisdom and improved technique.

MISTAKES.*

BY TRUMAN W. BROPHY, M. D., D. D. S., CHICAGO, ILL.

A distinguished clergyman, not long since, while speaking of the life and works of a man whose achievements had made his name conspicuous throughout the nation, used these words: "He was a great and good and noble man, but he made mistakes; he was human, not divine."

This utterance impressed upon me the oft-repeated axiom that "to err is human." And in our walks along the pathways of life our knowledge is increased by making use of the lessons taught us by observing and remembering not only our own mistakes, but those of others. To make a mistake is to understand and act erroneously, but to do anything wrong after we have learned how to do it right, is not a mistake, it is to disregard the admonitions of conscience.

It is my desire this evening to review some mistakes I have made as a dentist and to bring to your notice some of the mistakes of the members of our profession which have come under my observation. What I have written has been done with a hope that a knowledge of our mistakes may enable us to avoid a repetition of them, and, possibly, may prevent some young men from unpleasant experiences into which mistakes may lead them.

Thirty years ago this month, at the age of seventeen, I came to Chicago to study dentistry and after conversing with several dentists, entered an office, began to make nitrous oxide gas, vulcanize, grind teeth, take care of the office, and in the second year began to operate. I was desirous of going to college, but among the Chicago dentists whom I met there was but one expression, and that was I would acquire but little knowledge by going to college. Acting on their advice, I remained in the office, read textbooks and the dental journals, visited all the dentists in the city (there were about thirty-seven here then), and did all I could to learn. In doing this I made a mistake. I should have gone directly to college. It is no doubt true that some of my advisers acted in good faith, although mistaken, while others, the best informed, acted in absolute disregard of facts and my best interests. There never was a dentist who possessed the ability to teach a student as much in three years as the same student could learn in

*Read before the Chicago Dental Society.

college in the same length of time. The fallacy of the argument which led many young men to remain away from college until the period in life had passed when they might have taken advantage of the great privileges thus offered is, in the light of universal knowledge at this time, too apparent to require comment. I think it is a mistake for a young man to enter college when under nineteen. It would be better indeed I believe in almost all cases if students were debarred from admission to professional schools until they reach the age of twenty. The result would be, their preparation would be more thorough and they would make better progress, and at the end of their college course become better practitioners. When a dentist devotes all his time, outside of his practice, to the society of the laity, to the exclusion of matters pertaining to his profession, he makes a mistake. Every one of a social nature, enjoys the society of neighbors and friends, but the dentist who would rise above the mediocrity of his profession must read dental journals, attend dental meetings, write papers on dental subjects, discuss other papers, and become an active man among his confrères. If he does not thus assist his associates and by so doing broaden and advance himself, he makes a mistake.

While our journals often publish articles of little or no value, there is enough in them to interest and benefit the most scholarly men in our profession, and to fail to keep in touch with the best thought in dentistry, as presented to us through the medium of our periodicals, is a great mistake. It is a mistake to be hasty in making a diagnosis. No dentist should venture an opinion or make a statement to a patient as to what the nature of his disease is until he has given the case enough careful consideration to enable him to determine beyond doubt its true character. A dentist should not hastily say that his patient's teeth are in a good state of preservation until all the surfaces of the teeth are critically examined. Should the conditions presented make it necessary, proximal surfaces should be exposed to ocular examination, so that the operator may be certain as to what treatment, if any, will be required.

It is not easy to account for the views of those who persist in drilling so-called "retaining pits" in almost every cavity filled by them with gold. The vitality of many a pulp has been destroyed by such a practice. Retaining pits are almost always not only unnecessary, but they are a positive injury to the tooth in which they

are made and who ever uses them should discontinue the practice, as he is laboring under a mistake. Retaining pits, like cotton root canal fillings, were discarded by the best element of the profession many years ago; such methods have no place in modern dentistry. During the past week I have had occasion to treat a young woman who has lost the pulps of the superior central incisors, due to the unnecessary use of retaining pits.

It is a mistake to begin to prepare and fill teeth before removing salivary calculus and stains. No operator can tell the requirements of a case until the surfaces of the teeth are bright and free from discoloration, so that the line of demarkation between the normal and the diseased tissue may be clearly observed.

Quite recently a patient came to me presenting a complicated case which I will describe. The occlusal surface of the left inferior third molar was in contact with the distal surface of the second molar. The tooth was lying parallel with the body of the bone. The soft parts surrounding the third molar were in a state of acute inflammation and the patient's sufferings were severe. There was not only muscular soreness accompanied by lancinating neuralgic pains upon the affected side, but there was also an acute arthritis of the temporo-maxillary articulation. I advised the removal of the malposed molar, which was done with no more difficulty than is usual in such cases. The pain, which was quite severe subsequent to the operation, was controlled by administering narcotics and by applying hot fomentations externally. The patient gradually improved, but in two weeks after the removal of the tooth there was a recurrence of the pain equal in severity to that which the patient first experienced. The swelling about the angle of the jaw had disappeared, the acute inflammation had subsided, and the cause of the return of the pain was not easy to comprehend.

Following the complications named, I discovered there was still another. The second molar which was in contact with the malposed third molar was somewhat loose; there were two large amalgam fillings in it, one in the occlusal, the other in the buccal surface. The tooth was very much discolored, did not respond to the heat test, and as it was not firm in its socket I presumed its pulp was dead. It had every appearance of a tooth affected with pericementitis. I drilled into the large buccal amalgam filling and removed it. I found a layer of dentine between the amalgam and the pulp which I cut away. There was no pain attending the op-

eration, except that due to the pressure upon the pericementum, until I passed below the pulp chamber, which was partially filled with calcific matter, when I found living pulp tissue in the lower two-thirds of the canals of both roots. I applied to the surfaces a solution of 95 per cent carbolic acid, sealed the cavity and dismissed the patient. The following day she returned and expressed herself as being free from pain except that caused by pressure on the tooth. I applied at this visit a paste of creamy consistency of 95 per cent, carbolic acid with granules of cocaine which anæsthetized the remnants of the pulp, so that I was able to remove them without discomfort to the patient. The canals have since been filled, the tooth is becoming more firm, and the patient is no longer in pain.

Had the second molar shown the symptoms of disease which developed after the third molar was removed, I think its extraction might have been indicated, as with its removal the pressure of the tissue surrounding the third molar would have been removed and the patient probably would have been more promptly relieved of her sufferings. The second molar was a useful tooth as there was an upper molar to occlude with it, but the third molar of the upper jaw was missing, so that the malposed lower tooth never would have been of any value even though it had moved into a half upright position. Although my treatment was what I believed then and still believe in the best interests to my patient, I may have made a mistake.

It is a mistake to attempt to fill proximal cavities without having a good deal of room in which to work, and to secure enough room it is usually necessary to wedge the teeth apart a few days before operating.

The average dentist I think is not apt to teach his patients the importance of preserving the deciduous teeth. He does not impress upon his patients the necessity of thorough cleanliness of the mouth and teeth. Many mothers, otherwise well informed, seem surprised when asked if they carefully brush the infants' teeth mornings and evenings. Oftentimes they say that it does not seem necessary as the baby's teeth are so bright and clean. The mother makes a mistake by omitting this important service to her child, but it is because she does not understand her duty. It is not always her fault; more frequently it is the fault of her family dentist or physician, to whose neglect of duty the mother's

education upon the subject has been neglected. The most important place a dentist fills in the community in which he lives is that of a teacher. I believe that 80 per cent of the people, perhaps more, have no knowledge of the laws of hygiene as applied to the oral cavity; and believing this as I do, I desire to see all dentists and all physicians become active in informing the people in regard to this important subject. No one will question the breadth of the dentist's sphere if I am right. If 80 per cent of the American people require instruction in oral hygiene and in regard to the diseases of the teeth, 48,000,000 are uninformed.

I am sure the profession is making a mistake in continuing in an extensive way the use of rubber as a base for artificial teeth. There are other materials much better, and nearly if not quite as cheap. Rubber is objectionable because it is not a good conductor of thermal changes, and consequently the tissues which it covers are almost always kept in an abnormal state. Aluminum has great merit as a base, and when the teeth are attached with rubber the plate is vastly superior to rubber, and nearly as cheap.

The dignity of a profession is dependent upon the conduct of its members.

Dentistry will never hold as high a place in the estimation of people of culture and education as law, theology and medicine until we arise and do our duty to ourselves. The man who will not presume to call upon a physician and receive advice and a prescription, which would be given in ten or fifteen minutes, without expecting to pay a fee, would call on you, occupy a half hour of your time for advice, and feel that all the compensation necessary would be to intimate that he might possibly some time favor you with another call. The man who would willingly pay a surgeon \$100 for a minor operation requiring twenty minutes' time would declare that he was imposed upon if you charged him \$20 for one requiring equal skill and an hour's time. The man who would apply to a lawyer for advice which might be given in fifteen minutes will expect to pay a fee. But the same man will go to a dentist to have a tooth with an exposed pulp treated, and perhaps make five or six visits before the tooth is put in a good state of preservation, and when his bill is sent him will complain because the dentist required a fee for each time his services were rendered; but far more frequently the dentist will do himself the injustice of charging nothing for advice and treatment.

It may be that some dentists think free advice and free treatment will indirectly prove advantageous to them; but anything free is usually regarded of little value, and the dentist who follows such a practice lowers himself in his patient's estimation, lowers the dignity of his profession, spends his energy oftentimes when he should be preserving it, and thus multiplies mistakes. Every man should uphold the honor of his own vocation. No professional man can afford to be controlled by his patrons. Whoever seeks and receives his advice and services should accept them as the result of his best judgment.

No one should employ a professional man unless he has confidence in him; unless he believes he is honest. Where confidence is lacking there may be very frequently, either real or imaginary, many mistakes.

So then as we daily form a link in the chain of life and in our professional career we are constantly on guard to avoid mistakes. We reach forth in search of knowledge, employ our talents to the best of our ability in the interest of our patients, notwithstanding which, we make mistakes. "We are human, not Divine."

OPTIMISM AND PESSIMISM IN DENTISTRY.*

By C. P. PRUYN, M. D., D. D. S., CHICAGO, ILL.

This paper is not intended to be an erudite dissertation upon any special operative procedure, or on physiology, pathology, bacteriology or any other ology. I simply wish to call your attention to some of those thoughts that occasionally come to one and cannot be expressed in the discussion of any of the various subjects we have under consideration before this society, for fear of personal animosity or of provoking needless vehemence while we denounce what we consider a wrong; or, on the other hand, undue praise might be given some one because of a feeling of affection or esteem for a brother practitioner whom we dearly love.

Webster defines optimism as the doctrine that everything that is is the best; and pessimism, the doctrine that everything that is is the worst. The optimist is one who is always happy and healthy. He is continually looking on the bright side of things, and is buoyant and hopeful for the future; while the pessimist is

*Read before the Chicago Dental Society.

a chronic grumbler, and perhaps he may be so because of his torpid liver, and his torpid liver may be caused by his unhealthy mind. He sees no cause for jubilation in the present and no hope for better things to come. In this paper your attention is directed to some of the phases of both aspects of the present situation as it relates to dentistry.

The science of dentistry in the last decade has shown a wonderful advance in etiology, pathology, bacteriology and therapeutics. In the art of dentistry we have advanced in crown and bridge work, both gold and porcelain, and by these various methods of restoring some of the lost parts of the masticatory apparatus, have added materially to the length and usefulness of life. In recent years we have also added very much to the beauty of countenance and utility of the teeth by the correction of malformations of the teeth and jaws in what was once thought to be hopeless cases; in the preservation of decayed teeth by a more perfect knowledge of mechanical laws, in shaping cavities to retain filling material and in more perfect instrumentation. A better knowledge of metallurgy and of the working qualities of those metals used to fill the cavities, the use of drugs, both locally and systemically applied, and by the use of electrical osmosis or cataphoresis we have certainly made some prodigious strides forward in combating annoyance and pain that were formerly considered unavoidable to a successful operation. The last decade has marked a wonderful advance in our methods of teaching which have been almost revolutionary. Our colleges have grown in numbers and equipment until we have almost arrived at the acme of excellence in our teaching methods. Whether the next decade will mark a corresponding advance is a mooted question. While we are congratulating ourselves upon the success of our educational institutions, are there not still some things to be desired? It seems to me there are; and one of those things might be a post-graduate school, where students would be taught how to conduct a practice upon strict business principles, and not go through life poor as a church mouse, as the majority of us do. We see mountains yet before us to be scaled, and to my mind's eye one of the highest to be reached is that of discovering a suitable insoluble cement for filling purposes. We must not lose sight also of the wonderful advance that has been made in surgery and surgical pathology. But while the past of our profession has been

one continual advance in both the science and art of dentistry, I think I see some clouds upon our professional horizon that portend evil results unless they are dissipated; and one of these is the abuse of the dispensary by people able to pay the usual fee to the dentist in private practice; also the college advertisement in the daily papers inviting patronage. Is it not just possible that the multitude of cheap advertising dental parlors of "work done free; \$2 a set; \$2.65 for crowns," and so on *ad nauseum ad infinitum*, are in some way following the example set by the dental colleges in advertising for patients; and may there not be some truth in the statement that we are cutting our own throats, so to speak, by graduating such great numbers of students every year who at once open up offices for practice in competition with those who have just signed diplomas that gave these same students the legal and moral right to so compete with their instructors?

Under the head of professional amenities we see many things to praise and also many to condemn. I know of some men who have never been heard to say a good thing about another dentist. In the creation of such persons the Almighty seems to them to have exhausted his perfect work in their creation, and all others have very grave faults, real or imaginary. Such men are imbued with the thought that it is their special duty to inform all the people they meet of the particular faults that dominate each and every brother practitioner.

Another cause for apprehension is a manner some so-called professional men have of speaking disparagingly of their brethren to the public or to patients that should call for emergency treatment. You and I have known of men who, when asked about the standing or ability of a brother practitioner, will shrug their shoulders, look wise, and say, "Oh, I guess he is all right enough, but I think he has not had sufficient experience yet for you to put your case in his hands." "Oh, I guess he means to be all right, but he is an old fogey," "He is slower than tar in winter;" "Oh, yes, he is a good fellow, you know, but he doesn't know much about dentistry." "He is doing too much college work or too much writing. He edits a dental journal, you know; he gives too much attention to outside work, to his farm, to his fast horses, or the bicycle, or to churches, or he is too much of a society man. He is a great singer, or he is too much of a hobbyist on gold or amalgam or plate work, or orthodontia, or something else." Or the re-

ply may be, "He is a clever fellow; he is one of the best talkers in our medico-dental surgical society. But you just ought to see one of his patients that called upon me last week. Why, bless you, sir, it was the most abominable dental work I ever saw in all my life. He is the greatest bungler that ever attempted to fill a tooth." Or, if there is no other fault to find, and his skill is generally admitted to be of the best, it is so very easy to say that his charges are simply extortionate, and if you go to him to have your teeth fixed you had better make up your mind to mortgage your house and lot to get enough money together to pay his fee.

Now, gentlemen, these are not all fanciful figures that I have drawn for your entertainment. They are stubborn facts that you are fully as cognizant of as myself, and I direct your attention to them so that we may possibly avoid some of the professional breakers I see ahead of us, as many of the latter things I have mentioned are the ones that have a tendency to cause us to be somewhat pessimistic regarding the future of our profession.

Now, the question I want to put to you as brother practitioners is this: Is it honest and just for us to do any of these mean, contemptible things to any man, particularly one of our own calling? Does it have a tendency to raise the standard of the profession in the estimation of the public, or does it not? I know of cases where a word or two of praise, kindly spoken by older men in favor of young practitioners comparatively unknown as dentists have been the means of great assistance to them in point of morality, integrity and professional success. I have also known the opposite condition to prevail in a great number of cases.

And while it is but natural for the young men to desire recognition and appreciation from the older ones, I sometimes wonder if the younger members thoroughly appreciate what has been done for them; and if they always are just, and true, and honest in their endeavors to reciprocate for the kindness shown them by their elders.

I have only one more question to ask and that is: Does the spirit of true gentility characterize our profession? Dealing so largely with suffering women and children, are we always kind and patient and sympathetic and gentlemanly in our behavior toward them? And last, but not least, how do we stand in the estimation of the public? What are we doing outside of our profession to make the world better? Are any of our members taking part in any

of the world's great charities, or any of the great organizations for the amelioration of suffering humanity?

Are we taking an active part in politics, either national or municipal; or do you ever see the name of a dentist connected with sanitary or hygienic measures for the betterment of our municipality? Or, are we too well satisfied with ourselves and our environments to lend a helping hand to those less favorably circumstanced? Or the excuse may be, that after the arduous labors of a full practice we are too nervously exhausted to attempt anything more. But while this last excuse is a valid one in many cases, ought we to yield to such an excuse as we generally do and thus take little or no interest in the world's great developments?

SENSITIVE DENTINE.*

BY GEO. F. CHENEY, D. D. S., ST. JOHNSBURY, VT.

It is with no little timidity that I present a paper to this assembly of learned men. I have for the past six or eight years looked upon the Chicago Dental Society as an institution of learning; its members my instructors.

In presenting this paper it is not my purpose to give you much that is original, but to give you some knowledge, and ideas of others, coupled with my own, hoping to start a discussion of a very important subject.

A year and a half or so ago I received an invitation to prepare a paper for one of our eastern societies. At that time a great deal was being said by a certain class of dentists regarding painless dentistry. My thought was if these men can do all their dental operations painlessly, some of our leading professional men will have some knowledge of it. I conceived the idea of sending a list of questions to about seventy-five of the leading men in the United States, hoping that I might gain some information, if not solve the problem. I certainly got a great deal of valuable information, but the question is still unsolved.

Soon after sending out these letters my office was burned, together with all my dental journals and part of my books; consequently I gave up the preparation of the paper until an invitation was received from your society.

*Read before the Anniversary Meeting, Chicago Dental Society, February 1, 1897

The questions sent out were as follows:

1. What is the cause of sensitive dentine?
2. Is it an abnormal condition?
3. Do the dentinal fibers directly anastomose with the nerve fibers of the pulp, or is there an indirect connection of the two established through the intervening reticulum of living matter?
4. Some have asserted that sensitive dentine was caused by an inflammatory condition set up by decay. Could this be true?
5. What influence does this inflammatory condition caused by decay have upon the dentine?
6. What causes the hypersensitiveness in buccal cavities of bicusps and molars and labial cavities of the anterior teeth?
7. Is it the nearer proximity of the cavity to the pulp, or an inflammatory condition of decay increased by an extra amount of acid excreted from the inflamed gum?
8. What is your treatment of sensitive dentine?
9. What action do the medicaments known to the profession have upon the dentine.
10. May not the strong coagulants that are used by many have an injurious effect upon the pulp by being transmitted to it through the dental tubes?
11. Is there anything that can be safely used better than sharp instruments cutting lengthwise of the fibers, that is, cutting toward the coronal portion of the tooth?
12. May not sensitiveness of the dentine be greatly increased by cutting against the fibers toward the cervical portion of the tooth.

About fifty replies were received, which greatly exceeded my expectations. A few of them I will give in full.

Dr. S. B. Brown, Fort Wayne, says:

"Do the dentinal fibers directly anastomose with the nerve fibers of the pulp, etc.?"

"I cannot give an opinion only from long observation which favors the affirmative, as indicated by sensation in projecting dentine suggesting indirect connection.

"Dentine is, so to speak, living bone, hard and soft tissue combined; the tubuli animal, the dentine mineral.

"Sensation attends vital structure (tissue) thus sensation in dentine is normal from vitality in the tubuli contents, varying in degree of sensitiveness by varied conditions. The dentine has

varying proportions of the mineral elements; that containing the least is most subject to decay, and at all times most sensitive. This leads to the questionable statement by some that decay favors exalted sensitiveness when defective calcification is alone the cause.

"We know that decay is not a cause when we grind sound dentine for crowns, etc.

"The cause of increased sensitiveness in labial and buccal cavities is due to the fact that these cavities are generally located on the cervix where there is a constriction and condensation of tubuli—vitality, a greater per cent of life in a given area.

"Questions 'May not the strong coagulants used by many have injurious effects, etc?'

"I should judge could be answered in the affirmative from the numbers flooding the country."

Dr. Brown gives prescription of Dr. C. N. Pierce which he uses with some advantage:

R Cocaine.....	gr v
Carbolic acid.....	gr xx
Chloroform.....	3ss
Muriatic acid.....	m. x
Alcohol.....	5ij

Also says great help comes from manner of using instruments when forming cavities. Does not recognize much difference in the direction taken when excavating. It is unmerciful and unpardonable to use dull instruments or an engine that does not carry its points steadily

Dr. Cravens, of Indianapolis:

"1. It is a normal condition. It is due to incomplete calcification of the embryoplastic filaments projected from the odontoblasts; these possess the double property of conveying sensation similar to nerves, and are of course subject to irritation by external relations.

"The sensibility is normal, because when the pulp dies there is no longer sensation conveyed through dentine, and the embryoplastic matter existed from the tissue of the sac.

"2. I cannot say as to "direct" anastomoses. The dentinal fibers spring from and apparently return to the bodies of the odontoblasts, as disclosed by the microscope; the odontoblasts have nervous support from the system within the pulp.

There are short connecting filaments between the odontoblasts that form a persistent reticulum, and doubtless prompt sympathetic or collateral activity of either function possessed by these remarkable bodies.

"3 and 4. The idea that sensibility of dentine is due to decay is ridiculous; a tooth freshly broken is sensitive although there had been absolutely no decay. There may often be noted increased sensibility of dentine immediately underlying a tract of decay; but this is always in partially decayed tissue, that has been deprived of its lime salts, wholly or in part by action of the eroding agent of the decay. To be understood fully, let us start with a proposition that in living, healthy (normal) dentine, there always is an equilibrium of constituents; any disturbance of this equilibrium results in abnormal conditions; disturbance of equilibrium of constituency may cause increased sensibility, diminished sensibility, or absolute loss of sensibility, without appreciably affecting the pulp of the tooth. This equilibrium of constituents is disturbed by inconstancy of the mineral elements only, which may be increased by imperfect nutrition resulting from protracted illness, or improper diet, or possibly starvation, because these elements are derived from external sources and necessarily variable, while the organic or animal elements are persistent.

"Therefore, when under decay of the former class for example we find a leathery mass that in no respect resembles dentine, yet it is exceedingly sensitive, far more so than solid healthy structure, we understand that it is the persistent animal constituent of dentine that has been deprived of its proper accompaniment of lime salts. From such an example and other points of observation of the phenomenal variableness of dentine sensibility, we draw the conclusion that with diminishing proportion of the salts of lime in dentine, sensibility increases. On the contrary, in aged individuals who may retain their natural teeth, we observe that there is a great reduction of sensibility, and even entire loss of it except very close to the pulp; that these are friable and retain metallic fillings with little satisfaction, showing a too great proportion of mineral elements. Therefore the second conclusion is that an increase of proportion of lime salts thus disturbing the equilibrium by hypernutrition, reduces the sensibility of dentine; and thus the man is blessed in the insensible grinders of his declining years.

"5. The notable sensitiveness in the buccal and labial regions is due to several conditions, partly structural, and partly environal or regional; for instance the tubuli of dentine are parallel for nearly their whole length, without being connected by anastomosing branches, in the regions of the cusps or incisive or occlusal parts, and when the enamel has been eroded or worn away so as to expose a section of such parallel tubes, the irritability appears not to increase in direction of the pulp as much as laterally or across the tubes, nor yet as much as immediately under the enamel; in fact the latter region seems to be the most sensitive of all, a condition that is attributed to the fact of the countless multiplicity of loops and anastomosing branches at that point. Another item relating to the buccal and labial regions is that they are nearly always protected from thermal changes by the enveloping mucous surface of the cheek or lips, and do not become accustomed to conditions of environment that the incisors are familiar with; for instance, air and fluids are generally tempered before they reach the buccal or labial faces of teeth. So also with respect to solid food.

"6. I try to extract the moisture from the structure and just in proportion as I succeed in desiccating tissue do I reduce sensibility therein. So far as I know, the medicaments sold to and used by dentists for this purpose, so far as they are effective at all, operate by desiccation of tissue.

"I know nothing about hypodermics in this connection, although the quacks resort to that, with what success I cannot say; I have met with variable success with absolute alcohol, with a solution that contains 75 per cent menthol, and 25 per cent phenol, either of which must be evaporated with warm air, and the teeth kept isolated from saliva.

"The absolute alcohol works the better, but should be preceded by commercial alcohol, as the absolute otherwise will cause pain—sometimes extreme pain. Cocaine is totally ineffectual upon sensitive dentine. Measures for reducing sensibility are often not continued long enough to obtain good results. There is too much haste.

"8. The current of transmission is from the center toward the periphera; besides Dr. A. W. Harlan, of Chicago, an authority on therapeutical values, has declared emphatically (1895) that the coagulants are all self-limiting, and as their action is super-

ficial the coagulum formed stops the agent almost at the point of contact, while they do no harm thus to the pulp, they do no good to the pulp or anything else. Coagulation is not antiseptization.

"9. Sharp instruments are less dangerous than dull ones in skillful hands, and cause less pain.

"10. This matter of manipulation rests with the operator, whether the preparation of a sensitive cavity shall be rendered bearable. It does not all consist in the direction cut by a sharp instrument. These are helps. It cannot be done painlessly by influence of drugs in local application, nor by desiccation. These are merely helps that enable a most excruciating operation to be performed with reasonably modified discomfort to the patient. Much may be accomplished by discreet impressions made upon the mind of the patient. The process, while a conversational one, is of a hypnotic character, but not profound nor of somnambulistic nature."

Dr. Guilford, of Philadelphia, says: "Sensitivity of dentine is entirely normal; same as that of any vascular tissue. We have pulp, next to this the odontoblasts and continuous with the latter probably dentinal fibrils going out to periphery of dentine. Dentinal tubes connect at various points along their length.

"Hypersensitiveness is of course abnormal, due to irritation caused by heat, cold, and foreign matter in cavity. In labial and buccal cavities we usually have the white or rapid decay in which only the lime salts are dissolved out by acid and the remaining vascular matter is thus left exposed and unprotected, hence its greater sensitiveness. It is not due to greater proximity to pulp. Sensitivity in cavities I treat with warm air and sometimes with obtundent composed of cocaine, chloral hydrate, etc.

"Sensitivity on surface, due to erosion or abrasion, I treat with nitrate of silver, caustic potash, or chloride of zinc, parts being first dried and protected with rubber dam. One or more applications of either of the three usually gives relief.

"Do not consider coagulants dangerous except when applied too near pulp. Have not found much difference in direction of cut."

Dr. Abbott, of New York, says:

"1. Inflammation.

"2. Yes.

"3. Sometimes 'Tomes' fibers' are direct branches from the

nonmedullated nerve fibers of the pulp. In other cases are last in the reticulum of living matter of the medullary elements at the periphery of the pulp.

"4. Yes.

"5. The entire dentine of the affected tooth becomes hypersensitive, and in the neighborhood of the decalcified portion the canaliculi are very much increased in size, and the amount of living matter is found to be much greater than normal.

"6. The necks of teeth are endowed with a greater amount of living matter than any other portion of them, consequently are more sensitive.

"7. Restore them, chemically, to their normal (alkaline) condition by the use of bi. carb. soda.

"8. Some escharotics (zinc chloride and caustic potash) destroy the living matter to a limited depth in the carious and disorganized dentine. Others, such as cocaine, aconite, cannabis indica, camphor, etc., and their combinations, are supposed to benumb or render the living matter insensible to pain.

"9. No escharotics (coagulants) used in the teeth are far reaching enough in their action to injure the pulp of a tooth through any considerable thickness of dentine.

"10. Yes.

"11. I have never noticed any special difference in the sensitiveness of a tooth by cutting in any particular direction."

Dr. Andrews, Cambridge, says:

"In answer to your first question, 'What is the cause of sensitive dentine?' I will reply to your second question and say it is an abnormal condition, as dentine itself, in a perfectly healthy condition, should not be at all sensitive, according to authorities.

"To your third question, 'Do the dentinal fibers directly anastomose with the nerve fibers of the pulp, etc.?' I would answer that it is not known just how a connection is brought about. I myself have no doubt but what there is a connection, in some way. Sections that are very thin show nerve fibers that are very fine. Dentine is a difficult substance to demonstrate these fine fibers if there are any in it. I have seen fine nerve fibers from the pulp running between the odontoblasts as though they were to enter the dentinal canals, and that is as far as I have been able to trace them. Tomes mentions the remarkable specimen of Dr. Dentz, of Utrecht. 'These which were cut from embryo while about

half the thickness of the dentine was formed, show pear shaped bodies arranged with regularity a short distance within the border of the dentine, the smaller end being directed toward the pulp and being at their small end connected with one or more dentinal tubes. These pear shaped bodies have two or three large nuclei, and present a close resemblance to some forms of nerve end organs.'

"In regard to a reticulum of living matter; the only living matter is from the fibers or their branches, Heitzmann's reticulum being only a fibrous connective tissue, scaffolding, which is calcified with the matrix.

"Question No. 4. I should say the sensation was caused by irritation and not by true inflammation. We cannot have true inflammation in tissue like dentine. This irritation is undoubtedly caused by foreign substances, the action of acids, etc.

"To No. 5. I would reply: I do not believe there is any true inflammatory condition. The irritated or sensitive condition caused locally by decay, may make the whole tooth more or less sensitive.

"To No. 6. The exposures of the fine terminating ends of the dentinal fibers, to irritants, acids, etc.

"To No. 7. Outside irritants, acting on the most sensitive portions of the tooth may be acids or anything else.

"To No. 8. I get the cavity dry, use sharp instruments, cutting with the direction of the fibers, with a quick, sharp stroke.

"To No. 9. I cannot answer fully, undoubtedly some of them are injurious.

"To No. 10. I should say some of the coagulants, such as chloride of zinc, might have an injurious action on the pericemental tissue.

"To No. 11. Sometimes I find cocaine and glycerine mixed to a paste to be very good.

"To No. 12. I would say yes, decidedly so, although cutting any way in that zone of softened tissue caused by the acids given off by organisms will act on all the fibrile imprisoned in the softened mass, whatever way you cut. The irritation of diseases of the sockets, pyorrhœa, may be transmitted to the whole substance of the dentine an irritated and sensitive condition. In fact, any trouble of a sensitive and painful nature may be transmitted to the teeth.

"I believe the sensitive condition of the teeth is more often caused by a diseased condition of the general condition than is ordinarily supposed to be, the teeth sharing their part of this abnormal condition with all the other organs of the body."

Dr. W. C. Barrett, Buffalo, says:

"1. An irritated condition of the protoplasmic elements of the dentinal fibrillæ.

"2. Necessarily, yes.

"3. It is not a direct anastomosis, or continuous condition.

"4. In a modified degree. Protoplasm does not take upon itself the usual inflammatory conditions of fully organized tissue, but its condition is materially modified.

"5. It is at the junction of the enamel and dentine, and the cementum and dentine; and the sensitive places are often at the location of the so-called interglobular spaces, where there is an excess of living matter. The proximity of the pulp also increases the irritation due to thermal changes especially, and the whole may be influenced by a degenerated condition of the mucous follicles, which exists in great numbers at the cervical portion of the mucous membrane.

"6. The conductive power of the dentinal fibrillæ may be suspended by paralyzation. This may be accomplished by coagulation, partial or complete, by desiccation or by refrigeration. Certain remedies also have the power of modifying their conductive or their receptive power. I depend mainly upon desiccation, and combine with this modifying sedatives. I also use prophylactics given internally. There are a great many remedies which act at times and in certain cases upon dentine. It is impossible to set them down here because to make their use intelligible some statement must be made of the condition in which each is applicable. Probably in connection with warm air I use the essential oils more than any other one thing.

"7. Undoubtedly, yes.

"8. There is nothing better, but other things may be used in connection with good results.

"9. It may be increased by any rough treatment.

"Of course, I give but my own views, and though I speak dogmatically to save time, I only give my ideas for what they are worth."

Dr. E. T. Darby, Philadelphia, says:

"1. What is the cause of sensitive dentine? Is it an abnormal condition? I think it a perfectly normal condition. All real tissues with rich nervous supply are sensitive. The fibrillæ undoubtedly have an intimate relationship with the pulp, and any injury to the fibrils is conveyed to the pulp. Healthy dentine is sensitive, but not to the same extent as diseased dentine (decayed dentine).

"2. I don't believe in the theory of inflammation in the dentine. We cannot have inflammation without blood vessels, and there are no blood vessels in the dentine. The fibrils in the dentine are nerve fibrils, and are a prolongation of the odontoblastic cells upon the surface of the pulp.

"3. I have always looked upon the hypersensitiveness of the dentine as dependent upon the amount of acid present in the decayed structure. This hypersensitiveness may be diminished almost instantly by putting in the cavity of decay a little bicarbonate of soda before beginning to excavate.

"Cavities along the labial and buccal surfaces are often more sensitive because they are bathed in an acid mucus from the gingivæ. It is always well to apply a little bicarbonate of soda before beginning to cut these, especially if the rubber dam be not first applied.

"I don't think the nearness or distance from the pulp has anything to do with the excessive sensibility.

"My treatment for sensitive dentine is the following: First. Apply rubber dam. Then pack into cavity for a moment bicarbonate of soda. Then wipe the cavity with absolute alcohol, dry thoroughly with warm air (not hot air), then put into the cavity for a few moments "Robinson's remedy" (equal parts carbolic acid and caustic potash) and dry the cavity again, and go ahead with sharp excavators. When I have done this I have very little complaint on the part of my patients.

"I don't think cutting from the pulp instead of toward it has anything whatever to do with the promotion or abuse of pain in excavating. Somebody made such an assertion years ago, and it has been handed along from one practitioner to another without question.

"There is no physiological reason why it should be true, and my experience and observation convinces me that there is nothing in it but theory.

"If the dentist will take the time in each case to give preliminary treatment indicated above he will not be troubled much in his effort to excavate sensitive dentine. He may be obliged to renew the application if the decay be deep seated, but it is well worth the time spent."

If time permitted I would like to give several more of these letters.

It will be noticed all but three give sensitive dentine as a normal condition. Drs. Andrews, Abbott and Barrett say it is an abnormal condition. While I am not prepared to state from a scientific standpoint, I believe that all disease is caused primarily by an irritant. Histology and microscopy do not demonstrate that there is any actual connection between the odontoblastic fibrils in the tubules of the dentine and the nerve fibers of the pulp, therefore the assumption would be that there is none. From an operator's standpoint one would assume that there is some connection. I have found very sensitive dentine, when trimming a perfectly sound tooth. What this sensation is I do not know, probably irritation and contraction of the dentinal fibers; neither do I know what the connection is between the dentinal fibers and the nerve fibers of the pulp, but that there is some connection I am sure.

Dr. Bodecker* says: "Since we know that nonmedullated nerve fibers have the same structure as the dentinal fibers, we must conclude that both the nerves and dentinal fibers are made up of living or contractile matter, the contraction of which is facilitated by the presence of vacuoles. For according to modern researches the conduction of sensation centripetally, and of motion centrifugally is very probably instituted by the contraction of the living matter."

He also states that at the periphery of the dentine (the interzonal layer) is the beaded appearance of the dentinal fibers, lacking vacuoles in this situation. The fibers are bifurcating as is well known and becoming more and more delicate; correspondingly exhibit more and more beads.

The reticulum into which the lateral conical offshoots of the dentinal fibers inosculate is extremely dense—much more so than in the rest of the dentine. The densely reticulated zones usually

*Anatomy and Pathology of Teeth.

corresponds to the depth of the bifurcation of the dentinal fibers.

The presence of this dense reticulum of living matter evidently explains the fact that the interzonal layer between enamel and dentine is so extremely sensitive.

Sensation may be greatly increased by the presence of acids in cavities of decay, especially in certain classes.

In buccal cavities of the molars and bicuspid and labial cavities, near gum in the anterior teeth, we find greater sensitiveness, being caused in part by there being a greater amount of living matter. This is proven pretty conclusively by Dr. Black in his experiments, and published in the *Dental Cosmos*, 1895, where he says: "This revealed the fact that the dentine of the crown of a tooth is generally heavier in proportion to its bulk, is more dense than the dentine of the root," weight gradually diminishing from crown to apex.

To my mind the hypersensitiveness of these cavities is mainly caused by an acid excreted from the gum, usually inflamed, keeping the cavities continually bathed with it, destroying or breaking down the mineral constituents of the dentine, leaving an extra amount of irritated living matter.

Any alkaline substance in or taken into the mouth is kept from these cavities by the close contact of the cheek and lip.

The treatment of sensitive dentine has been much and varied, also medicaments used are many and varied. None of the ways of treatment or medicaments used seem to be satisfactory in all cases. Treatment may be systemic or local, or both. Locally it would be either to paralyze the living matter of the dentinal tubuli which can be done with such medicaments as the anæsthetics, like chloroform, ether, alcohol, cocaine, the essential oils, and electricity, or destroy it by the use of such medicines as the coagulants, like carbolic acid, caustic potash, chloride of zinc, etc. The coagulants are self-limiting, as has been well proven by Dr. Harlan and others, consequently they coagulate but a slight depth and are harmless.

My own treatment is to apply rubber dam, pack the cavity with bicarbonate of soda for a minute or two, wash out with alcohol, and evaporate with warm air, not hot, using the warm air until dentine is dry. If this does not put the dentine in condition to be worked with sharp instruments without much pain, I place in cavity a pellet of cotton dipped in Dr. Black's 1, 2, 3 mixture,

or some of the essential oils, tannin and glycerine paste, cocaine and glycerine paste, or Robinson's remedy, as the case may be, drying out with warm air. This treatment in a majority of cases works very nicely. In mouths known to be strongly acid, or where there are labial or buccal cavities I have the patient use Phillip's milk of magnesia as a wash for a few days before the operation. With extremely nervous patients bromide of potassium in ten or 15 grain doses, three times a day for three or four days, will in many cases work like a charm.

I prefer bromide of potassium to morphine and the coal tar derivatives, although great benefit comes from these many times.

Much has been said the past year regarding cataphoresis. I can only speak from an observer's standpoint. I believe we are to see great things coming from electricity. Now it is only in its experimental state, with many disadvantages. I hope to see it do the work in less time, and without the aid of cocaine. I will say nothing more regarding it, as I see by your programme you are to have two or three demonstrations.

Dr. Craven has well said "Much may be accomplished by discreet impressions made upon the mind of the patient in a conversational way." Keep the patient interested in something foreign to the operation.

PECULIAR PATHOLOGICAL PERCEPTIONS.*

By J. D. PATTERSON, D. D. S., KANSAS CITY, MO.

The particular peculiar pathological perception to which I wish to direct your attention in this paper is the claim which has in recent years been put forth by certain pathologists belonging to our profession and which may be briefly stated as follows:

That "the inflammatory stage of true pyorrhœa alveolaris primarily begins in tissues on the side of the root near the apical extremity, and secondarily advances in the very large majority of cases toward the gingival borders," and that "the cause of this inflammation or pericementitis is the plastic exudation from the blood vessels freighted with salts, which in their deposition and crystallization upon the cementum of the root exert the influence of foreign bodies and act as irritants."

"That the chemical nature of these salts indicates a condi-

*Read before the Anniversary Clinic, Chicago Dental Society, Feb. 1, 1897.

tion of the blood in which there is an excess of uratic salts and uric acid." This is known as the uric acid or gouty diathesis, which is prevalent in gout and rheumatism, and the pathologists referred to ascribe this condition as the cause of the diseases commonly known as Riggs' disease, pyorrhœa alveolaris, phagademic pericementitis, alveolitis, etc., etc.

In discussing this subject your attention is directed to a well known fact which is stated in text-books upon the practice of medicine, which is as follows: I quote from the latest edition of Flint's practice of medicine. "It has often been too much the custom to consider all affection in persons subject to gout, as of a gouty character, and the gouty diathesis is often considered to exist upon insufficient data." For many years pathologists in the medical profession have persistently saddled upon a gouty diathesis, nearly every trouble known to be the result of perverted nutrition, and a few men in the dental profession, not to be outdone in the fascinating pastime of speculative etiology and pathology, have saddled upon the well-worn hack of a "gouty diathesis," nearly all of the ills which manifest themselves in the oral mucous membrane, and in the investment of the roots of teeth. The study of perverted nutrition has seemed to cause perverted perception, and as an easy road out of the dilemma they have followed in the wake of their medical brethren by giving a gouty diathesis credit for all oral diseases, where, in their minds diagnosis seemed to be doubtful.

Some years ago the writer was one of a class in the study of physics. For several lessons the subject was that of "gravitation" until all were supposed to perfectly comprehend the law upon that point. At a "quiz" shortly after one of the class was asked by the teacher, why a kite rises in the air? He promptly responded: "On account of gravitation!" It seems to me that some of our brethren have adopted an apparently easy explanation of the etiology and pathology of pyorrhœa alveolaris, and everything is laid to gout for the reason that their minds are full of it, just as was the student's upon the subject of "gravitation." Although three years have scarcely elapsed since these theories were first exploited by Drs. Marshall, Pierce, Burchard, Kirk, *et. al.* yet the writer has been confronted lately by statements of patients who came from unknown operators, claiming that they had been told that the disease of the gums from which they suffered was occa-

sioned by gout, thus conveying the impression that local treatment would be unavailable, and that nothing could be done (I might add parenthetically that nothing was done except to send such patients to a physician, and the cases were, and have proved perfectly amenable to local treatment.

Ever since the advent of a better understanding of pathological conditions largely brought about by Virchow and the well-known cellular theory—the elucidation of abnormal human complaints has gone along the lines of reason and science. The old “humoral pathology” has given place to a reasonable pathology which traces from cause to effect, and from effect to cause in logical sequences, but it seems to the writer that at times this reasonable way has perhaps been forgotten.

It shall not be our attempt to deny the morbid and predisposing influence of the gouty and rheumatic diathesis in the progress of pyorrhœa, but to point out that it is not the exciting local cause on account of deposits upon the apical portion of the roots of teeth, and that these deposits do not precede the disease. That pyorrhœa is not *per se* “a local manifestation of a constitutional condition.”

Even in gout, authorities differ as to whether the deposit precedes—or is a result of inflammation from impaired condition of nutrition and consequent abnormal condition of the blood. Ebstein—an authority on gout—in Flint's practice of medicine is quoted as saying that “The tissues which are the seat of urate deposits are in the condition of coagulation necrosis,” and that this necrosis precedes the deposition of urates and is caused by the abnormal condition of the blood. He also says: “An area of inflammation exists around the foci of coagulation necrosis.”

Dr. Burchard, in *Cosmos* (April, 1894), strangely quotes from Ebstein in support of the claim that inflammation follows instead of precedes the deposit, when Ebstein clearly states his belief to the contrary. In the article by Dr. Burchard just referred to, Ebstein is quoted as follows: That “gout is a nutritive disturbance, first leading to necrosis, and this followed by a deposit of urates in the necrotic area.”

Garrod, another authority upon gout, says: “A single attack suffices to cause a certain amount of the urate deposit in the affected joint.” These writers who have long been authority upon the subject of the uric acid diathesis and its manifestations, should

surely justify the belief that in pyorrhœa, even if the result of a gouty diathesis, the deposits are secondary.

The statements of writers in regard to the deposits having been found upon the apical portions of the roots of teeth, without any precedent lesion, have no doubt, been made with all candor and with a desire to arrive at a scientific explanation, but this testimony, it is acknowledged, is difficult to secure. The celebrated "lateral incisor," in possession of Dr. Kirk "upon which the pericementum had been destroyed from the apex to one-half way to the enamel border, the remaining portion apparently intact, certainly so at the gum margin," and upon which at a point one-fourth of an inch from the apex was found a deposit, and other positive, but so far as we are informed, somewhat dogmatic statements, of serumal deposits having been observed without preceding lesion either in the gum tissue, or pericemental disturbance from pulp abnormality, or traumatic pericemental injury, is scarcely scientific proof, when upon the other hand, scores of operators having had hundreds of cases of pyorrhœa in all stages, testify that solution of the gum margin and absorption of investing processes, have in every case been found where the serumal deposit appeared.

I have myself observed cases where the deposits were present without "apparent" loosening of the gum, but upon closer investigation have concluded that at one time there had been suspicion of gum inflammation, which had passed away in removal of the irritant, and the gum had probably reattached. The exceptions were in cases where pulp irritation, or pulp calcification, had created a necrotic condition around where the deposit was observed, the gum at the gingival margin being entirely undisturbed.

I desire now to direct your attention to another point, viz.: Authorities, as a rule, agree that the uric acid deposits are found in territory where the blood supply is meager, and the tissue non-vascular. Now, the peridental membrane is very vascular and reasoning from accepted authority, the urates would not be deposited in the vascular tissue of a root's investment, but in territory where "coagulation necrosis" would be likely.

C. S. Tomes says: "The alveolo dental periosteum is richly supplied with nerves and blood vessels."

Dr. G. V. Black says: "The blood supply of the peridental membrane is very bountiful in the young, and, although diminished as age increases, the vessels remain abundant."

It follows that until the normal nutrition of these parts has been destroyed by a precedent irritation, the deposit of urates would not be likely to occur. In vascular tissues, the blood forcing nutrition into the tissue ought to effectually prevent a stoppage or coagulation which is necessary to the formation of deposits. We therefore should expect to see the vascular investment of a tooth free from such accretions.

I will now direct your attention to the anatomical relation of the parts. They do not afford the opportunity for the depositions which are found in the classic seats for gouty deposits, viz.: The articular ligaments, tendons and sheaths, bursal sacs, the kidneys, the skin, the external ear, lungs, intestines, etc., etc. In all these positions, where it is acknowledged gouty deposits may be found, not one but what presents, even to the naked eye, a convenient place for the reception of abnormal urates, but when we examine the dense tissue about the root of a tooth, we cannot but wonder what a peculiar conception it is that concludes that in normal relation of these bones, there can be precipitated from the rapidly flowing blood current calcic material upon the cementum of a root.

I now show you a green lower maxilla, upon the right side. I have cut through bone and root of the second bicuspid about two-thirds way from the normal gum margin to the apex in order to give an object lesson to those who are so long from the dissecting room that they may have forgotten the absolute density of these related parts. Without a powerful glass no space can be seen between cementum and pericementum. Can you believe that uratic salts are here deposited? I cannot, there is no space for such deposits. In these "peculiar conceptions" under consideration there runs through the arguments brought out in support of the theories, a convenient bypath in which refuge is taken. This is found in the expression "true pyorrhœa." Driven into close quarters they escape by saying, "Ah! your cases were simply inflammation from salivary calculus, or other local irritation, and not 'true pyorrhœa' at all!" In other words, any pyorrhœa where the uric acid diathesis is not found and the disease is not destructive and stubborn, is not their beloved pyorrhœa at all, but simply a common vulgar case of local trouble consequent upon some irritation to the gingival margin of the gum.

This practice of designating the different stages of the same

disease as a difference *per se* is exasperating. It is acknowledged even by the supporters of the uric acid theory in pyorrhœa that local symptoms are nearly identical, whether the disease is entirely local or constitutional, and it is beyond our comprehension why it is not still pyorrhœa alveolaris, even if the causes are complex or simple, when the symptoms and results become identical.

As well might we say that other affections of the mucous membrane, such as catarrh or diphtheria, in their different stages, should receive a new name, as "true" catarrh or "true" diphtheria, if aggravated by complex local or systemic predispositions.

The principal points I have endeavored to make clear may be summed up as follows:

1st. That in gout authorities differ as to whether the deposits follow or precede the inflammatory action.

2d. That vascular tissues, such as the pericemental membrane, are not subject to the gouty deposits.

3d. That the dense anatomical structure of the parts about the root of a tooth do not exhibit the necessary bursa or the necessary character of tissue in which gouty deposits appear, unless precedent lesion has caused such space.

These conclusions, if true, all strongly argue against what I have called the "peculiar pathological conceptions" of Dr. Pierce and others upon the subject of pyorrhœa alveolaris and the gouty diathesis.

CHICAGO DENTAL SOCIETY.

Regular meeting held December 1, 1896, the President, Dr. Louis Ottofy, in the chair.

Dr. TRUMAN W. BROPHY read a paper on "Mistakes."

Dr. C. P. PRUYN followed with a paper entitled "Pessimism or Optimism, Which Shall It Be?"

Dr. J. G. REID opened the discussion on Dr. Brophy's paper: I have not had the opportunity of reading Dr. Brophy's paper. He has presented some good thoughts, but he has not given us enough good thoughts, and I suppose it is owing to the fact that he has not had sufficient time to give to the subject, and much less time have I had to think about the mistakes of other people. I have mistakes of my own to look after. It is about as much as I can do to look after my own mistakes and guard against making others in the future. Some of the mistakes I have made in my life have brought profit to other practitioners. I am very thankful that I have made mistakes. One of the thoughts that impressed me more than any other while the doctor was reading his paper was that pertaining to dental literature and the association of dentists with one another in dental societies. I have always favored this wherever possible. I like to meet with my professional brethren. I learn more in this way than by almost any other. By association we obtain information not only for the benefit of ourselves, but for the benefit of those who patronize us. I am a firm believer in attending dental societies. I have frequently heard one dentist say to another, "Why don't you go to the Illinois State Dental Society meetings?" The reply has been something like this: "I have not time; I am too busy; I have too much business." It has always occurred to me that if we stop to think for a moment we know that it is the busy dentists who attend society meetings. The men who do not attend these meetings are not overwhelmed with business, and they have to stay at home to attend to those patients that may happen to drop in occasionally. I do a little business myself throughout the year and yet I find time to attend dental societies, and I am always benefited by some one. I get ideas that do me a great deal of good.

Now, I have jotted down two or three things that I consider mistakes, and I am free to confess that I have been caught in my own trap. I do not care whether anybody else has caught me or not. One of the great mistakes, I think, is the crowning of teeth

that ought to be filled. I have seen this done too frequently. Another mistake that I have often witnessed, and I presume others have, is to attempt to disinfect a putrescent pulp canal in two hours. This is a mistake that is frequently made. While attention has been called to these and other mistakes, we find dentists to-day persistently following in the footsteps of their predecessors. If you do not see them the observant man does. I think it is a mistake to fill all pulp canals immediately. I have always thought so ever since I have been in the practice of dentistry, but there are men who differ with me, who think to the contrary, but that does not change my mind in the slightest degree.

Dr. R. H. KIMBALL: I have been much pleased in listening to the two papers, and what one may say in discussion of Dr. Pruyn's paper will apply in some respects to Dr. Brophy's. I was very much impressed with what Dr. Pruyn said in his paper with regard to our relations to one another—not our relations here, where we meet one another, because they are always right—but our relations to the profession when we are in our offices, and where we meet one another's patients. You have heard of what charity is, and if we are not charitable under these circumstances, it may follow that somebody will not be charitable with us some day. It is a serpent that stings at both ends, if you may imagine such a thing. You will surely get bitten yourselves some day if you undertake to criticise the work and standing of another dentist in the presence of one of his patients. Particularly do we hurt ourselves if we undertake to better ourselves in the estimation of a patient by criticising the man in whose hands the patient was last. We do not need to say much to hurt ourselves. You know what Shakespeare says about "Damning by faint praise." It cuts just as hard as to say nothing. It does not hurt us to express our approval of a brother dentist.

Another thing I was impressed with in Dr. Pruyn's paper was the need of business methods among dentists. I think we are very remiss in that particular. Many of us are not educated to business methods. We do not start as business men, and continue business methods in carrying on our profession. The suggestion of a post graduate school for instruction in business methods is a good one. There is much we have to congratulate ourselves upon in the progress our profession has made. There is no reason why we should be pessimists. We do not even need to be optimists.

But in some respects we are optimists, and need to be. Dr. Pruyn has pointed out much better than I can the directions in which we may be pessimists.

Dr. F. N. BROWN: I want to thank Dr. Brophy for his paper. It is a most excellent one. There is only one point about it that I feel like taking issue with him, and that is in regard to serving an apprenticeship. I think the young man who serves an apprenticeship before he matriculates in a dental college is the one who will succeed, all things being equal. I think that can be proven by Dr. Brophy's history, as he has given it to us to-night. It can be proven by the professional careers of many men scattered over the South and North with whom I am personally acquainted. Sometimes harm is done to a young man who matriculates first at a dental college, who takes a course in one college, and graduates and learns the particular methods of that college, as well as the methods of the demonstrator. A young man ought to make of himself all he can in dentistry. He should learn to think backward, and to think for himself. If he has any genius in him, he has got to learn to think for himself. He should ponder things in his own mind regardless of what the professor instructed him to do. A dental diploma is not a dental education by any means. It enables a man to practice, to earn a livelihood.

Dr. E. L. CLIFFORD: So far as I can see, I can only coincide with what has been said. There was a point in Dr. Brophy's paper that might be enlarged upon. Dr. Brophy has simply hinted at it, and that is, the "value of ourselves." I do not believe that in a profession that has developed as rapidly as dentistry has in the last two decades, one head is big enough to contain everything, or one man can become an expert in all of its branches. I believe there are many times when we can be of considerable assistance to one another if we do things with the proper spirit and in the proper way. I believe also there is great benefit to be derived from these professional associations, from this interchange of thought with one another. We have men in the dental profession that we know are experts in each of the different branches that belong to dentistry. If I get into a quandary, or a tight place, as we might term it, in regard to a piece of bridge work, and I go to a man who has devoted his time and energies to that special study, and who knows more about this special line of practice in a minute or so than I ever will know, and I call that man in consulta-

tion and get the benefit of his experience, I believe that man ought to be compensated through me for the benefit that I and my patient have received from him. I would not for a moment insinuate, or convey the idea that we should not be thoroughly professional with one another, but I believe there is a field in our specialty that has never been cultivated. I refer to consultations, and for those consultants there should be a fee just the same as in other branches of medicine. If I am troubled with a surgical case, a therapeutical case, with a case of operative dentistry, and I know there are men in our profession who can help me out, and those men knew that I could conscientiously send for them in consultation, and in that there would be a generosity of feeling between us that would be of mutual benefit to the patient, I would certainly give the patient the benefit of more skill than I could give him personally. I should make the patient pay a fee sufficiently large to justify me in using the brains of two men instead of one. I believe this is one way to raise the standard of dentistry in the estimation of our patients. For years I have hoped that we might cultivate the field of consultation with one another, and I do not think there is any other one thing that will generate more good feeling, and be the cause of eliminating possibly some bad feeling, than consultations in our dilemmas. If any of you are entire strangers to dilemmas you have advanced further in the profession than I have.

I desire to speak of a case which presented during the past two weeks. The case was that of a lady and the tooth an upper left bicuspid which had been abscessed and treated by one of our dentists, who so far as professional standing is concerned, would be pronounced *au fait*, if I should mention his name. She told me that she had been under his constant care, and had been to his office twice a week for the last fourteen months to have an upper bicuspid treated for alveolar abscess. I believe that is a mistake—to treat alveolar abscess for fourteen months. In exoneration of the dentist who treated the case, I would state that the tooth was not a normal one, as it had one more root than it ought to have had. But the dentist failed to discover it and consequently this was the cause of trouble. He made a mistake in not exploring sufficiently to find the trouble with the tooth. Every time he allowed the tooth to rest for a sufficient length of time, or attempted to close it up, there would be trouble. I found the cause, removed

it and filled the cavity, and I do not anticipate any further trouble.

Dr. Reid says he does not believe in filling putrescent pulp canals at one sitting; neither do I. I do not believe in filling *putrescent* pulp canals at any time. I do believe one of the mistakes that have been made in the past, has been too much treatment of root canals, and I am becoming more and more satisfied daily that the profession at large are feeling that it is not necessary to treat root canals as much as they used to. I do not want to be understood as making a rule to which there can be no exception, but I believe the time is coming when our treatments will be shorter and less, and if you will use a medicament with which you can destroy the vegetable cell without injuring the animal cell you will even shorten the time very materially in those cases that are now treated *ad nauseam*.

Dr. IRA B. CRISSMAN: I look at this question of mistakes from a little different standpoint than Dr. Clifford. The doctor conveyed the idea that the extent of one's practice was a little too much for any one head, or that the entire scope of dentistry was too extensive for one man to be perfect in all of its branches. I believe this is largely true, and that the day has passed by when any one man can comprehend everything in the dental profession. We know as dentists that we are not competent to do everything, and that there are other men more competent to do certain things than we are. If I should undertake to make a bridge for a mouth and felt that I was not competent to do it I know certain men in the profession who can do it very efficiently. If we feel that we cannot perform a certain operation we should recognize it and say so in justice to our patients, as well as ourselves. The day has passed when we can embrace everything or try to do everything. As far as the diagnosis of a case is concerned and taking up a brother practitioner's time in consultation, I think we as professional gentlemen should have a certain amount of courtesy and ask the advice of another practitioner and receive it without paying him a fee. I think there are few men in the profession to-day who are so extremely busy that they cannot stop for a moment or two and give friendly advice.

In regard to teaching our patients cleanliness—a great many men are everlastingly preaching cleanliness to patients and instructing them to brush their teeth when they themselves are not clean. This is a mistake.

Then, again, you will find in dental societies after the reading of papers on certain subjects—the majority of the members will pat the essayist on the back and take a very optimistic standpoint. They will say, “That was an elegant paper you read, doctor, and I want to compliment you on it.” If there is anything in a paper to which we can reasonably object we should not hesitate to say so.

Dr. E. M. S. FERNANDEZ: Optimism is certainly a good principle, but extremely difficult to follow in the practice of dentistry when you deal with intelligent and educated people. Say, for instance, a person comes to you and pays a fee for consultation. On examination of the mouth you find a very badly made piece of bridgework and the occlusion extremely imperfect and unmechanical.

How can you proceed with such a person in an honest and intelligent way and not show the other dentist to disadvantage?

Will not optimism, if followed too closely, lead to neglect and dishonesty on the part of a great many?

In regard to Dr. Brophy's paper I wish to say that I believe the greatest mistake a dentist can make is to advocate the beginning of dental studies in a dental office. If you only stop to consider for a moment you will certainly see the folly in it. Say a young man starts his studies with a dentist who has time to teach him, the student will not only learn one way of doing things but will also acquire a great many of his teacher's professional bad habits, and therefrom a narrow-minded and limited way of understanding things. If he attempts to commence his studies with a dentist of good practical knowledge such a man is too busy to devote much time to his student and the result will be, as usual, the student will learn to do a little crown and bridgework, collect bills and run errands.

In a reputable dental college students are taught in a scientific and systematic manner and by so many different gentlemen who are certain to teach different methods and thereby give them a broader and more correct knowledge of the profession, fitting them far better to meet their fellow-practitioners in their dental societies.

Dr. DON M. GALLIE: Dr. Fernandez seems very anxious to receive advice as to whether we should explain to a patient that may consult us, the imperfect work of the dentist who had previously treated the case. I believe if the condition of the work is

as bad as Dr. Fernandez has painted it we make a great mistake and do the patient an injustice as well as the profession if we do not come right out and say that the work was improperly done. We find work in some mouths that show skillful workmanship but poor judgment. The criticism of such a case should not be severe and the patient should be told that the failure of the work was due to faulty principle and not from lack of skill. But we see every day work in mouths that plainly indicate lack of skill and judgment and also indicating lack of conscience on the part of the dentist, the work smacking of dental malpractice. When consulted in reference to such a case tell the patient plainly that the work was improperly done. I have a case in mind which illustrates this point very nicely. The patient consulted me a few years ago. At that time I filled two lower molars with amalgam. The pulps in the teeth were in a healthy condition. Since then one of the fillings has failed and the patient, through the advice of a physician friend, called on a dentist who one day practices dentistry, the next drives a hearse and the next solicits for sewing machines. She desired to have the filling repaired, but instead of doing as she desired he ground the tops off the molars without devitalizing pulp and covered the teeth with miniature tomato cans. Since capping them the pulps have died, no doubt caused from the grinding of them down. Now each tooth has a nice abscess with fistula. A lower bicuspid with very small cavity in it was to be mutilated in the same way as the molars at the next sitting. Would I not have done that patient an injustice and the profession an injury by making an excuse for the poor work of this so-called dentist?

The calling in of another dentist in consultation over difficult operations may be a good idea, but I do not believe in referring a patient requiring bridge work to a dentist who may be very skillful in that line of work. Every dentist, I think, should be skillful enough to handle any bridge work or filling that may be necessary, and by recommending a patient to a specialist in this line is an acknowledgment of lack of ability.

With reference to young men serving an apprenticeship in dental offices, I take the same view that Drs. Fernandez and Brophy do. I believe that the best training is a college course for then the student is taught everything that is new and modern, and is not handicapped by having his head full of out-of-date ideas and methods so often taught by preceptors.

Dr. IRA B. CRISSMAN: I think Dr. Gallie misunderstood what I said. He said that if a patient was sent to another dentist who was competent to make a bridge, the dentist sending the patient would probably lose the case, or perhaps the patient would send his friends ever after to a specialist in bridge work, and that therefore he would be a loser. I claim that if a man is not competent to make a bridge and properly adjust it, he does the patient an injustice if he does not send him to a man who is competent to do this work. There are entirely too many men who have a smattering of this and that. We must acknowledge our faults. I consider that I am doing my patient more good by sending him to a specialist when I feel that I cannot skillfully and properly do the work myself than to make attempts at doing this work.

With reference to students entering dental colleges from various walks of life, and coming out of college better than those who serve apprenticeships, I think that is a mistake. Why? I will give you my opinion. When a man enters a dental college for the first time, he does not know a spoon-shaped excavator from a hatchet, and it takes him a much longer time to master these little things than if he served an apprenticeship in a dental office and worked under a preceptor. I consider that I accomplished more during the year that I was in a preceptor's office than I did in my first year at college. If I had not studied under a preceptor and obtained good substantial facts, I should not have been so progressive in my freshman year. I would not have advanced, and I would not have known as much as I do to-day.

Dr. A. E. BALDWIN: In regard to these papers and the discussion on them, they cannot fail to interest any one who is interested in this subject. The subject matter of the two papers is full of texts for remarks. The question has been put before us as to what are the duties of the profession to our patients and to ourselves. In the first place, we ought to be very careful in regard to the way we introduce young men and young women to the profession through our dental colleges. Our professors are leaders in our dental colleges, and should be not only excellent dentists, but broad-gauged, well-informed, well-balanced men. There is something beyond professional matters. There are some moral elements that enter into the subject under discussion, and we can perhaps illustrate this very nicely by using illustrations, and I will be pardoned for using them, particularly if they should seem to be at all personal, because they are not so intended.

I doubt if any of you who read the newspapers, and we all do, but what have been somewhat disgusted or disappointed in seeing notices in the papers about the clinics in our dental colleges, and you know, within the past few months in our society, quite a little excitement has been caused by the fact that a fellow practitioner, unintentionally or purposely, advertised himself, or somebody did it for him. And yet the same parties, some of them are responsible for the most peculiar effusions in the papers in regard to our dental colleges.

I think one of the mistakes made in the dental profession is in bringing students into dental colleges, and then having them work on patients which they are encouraged or compelled to bring in from among their friends. A man does not need to be gifted to realize what a college is aiming at to do that, *i. e.*, taking money from them to pay for instruction, then having them work their friends for the benefit of the college. These young men come in from the farms and offices, and enter our dental colleges, and are bright young men. They do not need to have a hole as big as the mill-stone to see through. They can see things that you perhaps do not think they see. They are gauging the profession of dentistry by the manner in which the professors are treating them in their college life. I have had patients come to my office to have work done, and have called attention to some defects in the previous work that had been done for them, and I think it is a mistake if we do not point out these defects. I have patients come to me, submit to operation, and when I call their attention to certain defects they say, "That cannot possibly be. This work was done last month over at the college." "Well, probably, it was done by students." "Oh, no, it was done by one of the professors." I think from what I have seen and heard from other dentists, the work must be all done by the professors, and usually by those professors who graduated the year before, and right here I want to say that such men, however bright, are unfit to be educators of or for professional men. Such instructors should be not only well-read, bright men, but men of practical experience and of strictest integrity, for the students should have integrity taught them both by precept and example, both being lacking in many cases known to all of us. These young men, these young women, entering dental colleges, are gauging the profession by that treatment.

Another thing. I was connected with an institution of learn-

ing at one time myself, and a gentleman came to me from the class and said, "Doctor, I would like to have you look at this tooth." "All right, what do you want to know?" "Do you know how much the material in that filling cost?" It was quite a large oxyphosphate filling, and I said I could not tell exactly. The student said, "Well, how much do you suppose?" I replied it might have cost a cent, possibly a little more or a little less. I said, "What do you want to know for?" "Well," he said, "Dr. so and so told us that any time we wanted work done for ourselves it would be done for just the cost of the material; that he would not charge us anything for his work, and he charged me \$2.75 for this filling." Now, what kind of an idea do you suppose that student has of the dental profession, as judged by that professor who did that work for him. You cannot laugh these things away. They are going to meet you on every corner as long as you live. These are mistakes.

A word in regard to the matter of how to treat patients that have been to other dentists. You must be self-assertive in order to be self-reliant, and in order to be self-reliant you must be educated—no one man can comprehend the whole world. You should not encourage patients to talk about what their former dentist did for them. Your duty to the patient consists in calling attention to any and all defects you find there and advise them to have them repaired, for you cannot know the circumstances under which the former work was done.

An old painter, who had been noted for his excellent harmonizing and blending of colors, was once asked a question by a younger man in the same profession. His question was, "How do you mix your paints to produce such a beautiful and harmonious blending of colors?" The old man looked and thought for a moment and replied, "I mix them with brains." You can see the application.

A good deal was said with reference to filling, or rather not filling, putrescent pulp canals. One gentleman said we had better not fill the root canal at the first sitting. Why did he not modify his statement by saying that it should be put in a clean condition and then filled? We all know there is just as much difference in root canals as there is in offices, and just as much difference in offices as in people. One can be easily cleansed, while another cannot. It is impossible to make a definite rule. When you get

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the debris and filth out of a 'root canal and get it dry you are not as bright as I think you are if you do not fill it immediately.

Lastly, I want to reiterate some of the points I wish to emphasize. We should not be looking around seeing how much fault we can find with some other practitioner, but let us hold up the mirror before ourselves, and the profession will be the better. Because a man has made a mistake, either ignorantly or purposely, it doesn't do him any good to have everybody jumping on him and calling him a fool. It does not help him. It does not help anybody else, and those who are connected with institutions of learning should see to it that they do not make this mistake. We have no right to take patients into our dental colleges and charge them anything for the work that is done there. The Lord knows that they ought to be pensioned for going there. I tell you it is a mistake. Our colleges are getting good fees. If they are not getting good enough fees let them raise them. There are lots of people whose circumstances are such as not to enable them to pay anything, who are suffering from ill health caused by lack of masticating apparatus. How nice and charitable it would be for our colleges to take this kind of material and do good work for them. If the students are to practice on somebody let them do it on people that cannot pay anything.

DR. GARRETT NEWKIRK: I have been quietly enjoying the remarks of the preceding speakers, not caring to enter into the discussion. A good deal has been said to the effect that the great fault in dental societies is that members pat each other on the back, never daring to criticise adversely. While there is a good deal in that perhaps, we have a few antidotes. I guess Dr. Baldwin does not know Dr. Crouse very well.

I am one of those who like to look on the cheerful side. I believe a good deal in optimism. I do not want any pessimism except so much as will enable me to arrive at facts and see things as they are for the simple purpose of making them better. That is all. Pessimism has the same use in the world that clouds have in the sky. Sometimes they give us better vision by toning down the light; they give us often gloomy thoughts; but after all the sun shines behind the clouds and the clouds are a minor proposition in nature. Sunlight is the rule; clouds are the exception, and the sunlight is optimism, in that it brings hope, love and encouragement. The clouds are a little discouraging; they come between us

and the sun. Optimism is encouraging, and I think most of us and most of those we know do not have any too much encouragement in this life. We have a great deal that is discouraging to contend with. Go along the street and look into the faces of the people that you meet, and just think how many of them look happy and bright and cheerful. How many of them have a discouraged, weary, anxious look—a look of sadness. There is not too much of optimism in life, and we ought to make the most of it. No person enters a room without carrying something of sunshine or something of a cloud. He does something to influence the atmosphere in which he is. He does something to control his own environments. I heard a wise, quaint man say once that if we should visit all the graveyards of the United States and look on all the tombstones we should find various causes given of death, etc., but, said he, you will not find upon any that a man “died of too much encouragement.”

Another point. We have heard a good deal to-night about what people should do and how they look at things, and I guess it is a good deal as we are ourselves. The atmosphere in our offices, the influence we exert and feel depends a good deal upon ourselves. (Here Dr. Newkirk told a story which beautifully illustrated the two extremes of both optimism and pessimism.)

As a rule I do not like to have a patient tell me where he has been before when he comes into my office. I do not wish to know who has done this or that. I give such patients very little encouragement to talk and as a rule they keep things to themselves. What I may be compelled to say at times is intended to make them charitable toward the “other fellow.”

I called Dr. Johnson to see a case with me where some live bicusps which ought to have been filled had been cut down for crowning. It was a flagrant case of malpractice in my estimation. I do not know who the dentist was. I didn't ask any questions. It was a case in which I had to fill the teeth and build up, instead of putting on crowns. I did my duty, and that is all there is about it.

I do not wish to make the “mistake” of talking too long, therefore I shall not touch on any of the college questions. I shall say nothing of putrescent pulp canals, except that it sometimes takes weeks or months to thoroughly disinfect one of the worst sort. I believe in trial fillings and keeping them in until you are sure you are safe, and then going ahead.

Dr. A. W. HARLAN: I think dentists are very good fellows myself, and this discussion shows that we all have different methods of looking at things. I do not think it makes much difference what dentist has previously operated on a patient that comes to me. I cannot always put myself in the place of the man who did the first work and who knew what the environments were. I have frequently had cases from other dentists where I was satisfied a mistake had been made, but the conditions might have been so different at the time and the condition of the patient and circumstances may have been such that the dentist would not have done what he did do under other circumstances. I have come to this conclusion, that when a person comes to me for services, it is no business of mine to abuse the last dentist who operated on him. If he filled the roots of teeth with cotton, perhaps he had sound reasons for doing it. The reasons might have been good at that time. I have had a great many failures in my hands that have furnished a great deal of work for practitioners in the city of Chicago, and it has not done them any harm. It has not done me any harm because I have profited by my mistakes. My practice has not grown less.

The first paper spoke about the dentist being a man of affairs. That is a very good idea. A dentist should be a man of affairs; he should know something else besides reading dental journals, dental text-books, etc. He should do something else besides teach dentistry in a dental college. I have been doing lots of things outside of dentistry and always have. I think anything that has a tendency to divert one's mind from the very close, hard-working profession is a good thing for him. We find dentists going into politics. We have a few examples of that kind, but the practice of a profession like medicine or dentistry and politics do not go well together. Dentistry is something that has to be followed right along, and so does medicine, and most political doctors and dentists find at the end of a short career that when they come to get back in practice it takes a long time to get into the old track. Even lawyers who have been out of practice long enough to serve in Congress two or three terms find that when they come back to take up their business again they get very little to do. Their clientele has fled.

With reference to dentists being connected with sanitary measures, engineering and drainage measures, I think we are

doing our share with other people engaged in the same lines. We do a great deal of gratuitous work of various kinds in churches, in literary societies, in various walks of life which is beneficial to the whole community. I am sure a great many men keep away from the meetings of this society at times because they are engaged in furthering some worthy enterprise of that kind. This work does not get into the daily newspapers because those men do not exploit themselves. There are men who are anxious to see their names in print. The dental profession is so young and dental colleges have been established such a short time and dental science is so comparatively new, that it is no wonder that dentists are not consultants on State boards of health and are not members of water ways committees and things of that kind. Dentists have to educate themselves, and it is only within the last six or seven years that we have had a decent curriculum in our dental colleges, and while our dental colleges need counterirritation once in a while, they generally get it. I think all of the professors in dental colleges are trying to uphold the dignity and honor of the profession to the best of their ability, and I like to associate with them myself.

It is a good thing for a man to belong to dental societies. I do not pat everybody on the back, neither do I want them to pat me on the back.

With reference to mistakes. I should say one of the mistakes a great many good men practicing dentistry make is to put crowns on teeth containing living pulps. I do not care what the circumstances are. The chances are in a few years most of them will prove failures. I have taken off numbers and numbers of crowns that were put over teeth with living pulps simply because decay had taken place between the teeth on the necks and exposed the pulp. When the crown was off it was the hardest work in the world to fit something over it. That is especially true of cap crowns at the end of the bridge where you cover the whole tooth.

With reference to the question of fees. Somebody spoke of consultations, etc. I think it is a good idea. The trouble is, our men are not up in the ethics of consultation. They do not take the right course in going at it. I have a great many men who want to get advice about cases without giving any previous notice. As a rule they will march the patient right into the office when I am in the midst of doing some tedious or delicate operation and

do not want to stop five or ten minutes. May be it will take longer to find out what is the matter. After examining the case the dentist will walk out with the patient and say, "Doctor, I thank you." From the standpoint of consultation, the advice of a man who gives an opinion ought to be worth anywhere from ten to twenty dollars in a case like that. I do not give advice for nothing if I can help it. When people write me for advice in regard to certain cases and do not send a fee, I throw their communications in the waste basket. After getting a few lessons of this kind they will stop. A man who wants to get advice should be willing to pay for it. If he cannot pay for it he should turn the patient over to somebody who can treat him properly.

Dr. ARTHUR B. FREEMAN: I have been hoping to hear some of the members allude to one statement which Dr. Brophy made in his essay. I was somewhat surprised to hear it, and have been more surprised not to hear some one take issue with him. He stated that in filling proximal cavities, wedges should be placed between the teeth for several days. That occurred to me as being a mistake. When I entered the profession, some sixteen years ago, this was a common practice, and for a time I indulged in this method myself, but have discarded it for many years, believing that it is a mistake to subject patients to the soreness which necessarily follows wedging. The pain of introducing a filling when a tooth is in this tender condition is terrific, to say nothing of the injury often done to the process and other tissues. Dr. Brophy did not place any limitations upon the statement he made, so I took it for granted that he wedged for several days, and followed immediately with the filling.

I am one of those unfortunate individuals who had a preceptor, and I am glad I did. If I were obliged to part with one of two things, I would part with my college training rather than the training which I received in my preceptor's office. Every year that I live and practice, I am more and more grateful that I had a good preceptor. As a rule, in years past, the demonstrators in dental schools were not what they should have been. The standard is improving, however, and I am glad that it is so. This gives the faculty and students better opportunities than they have hitherto enjoyed, and yet I can but believe that the student, having a proper preceptor, will become a mature practitioner earlier than the one deprived of such privileges.

Dr. C. P. PRUYN (closing): I am very much pleased with the thorough and free discussion. It leads to the conclusion that there is a great deal of truth in the statement made by some one that there are many sides to a thing, but only one center. We are accustomed to look on our particular side. We see the truth from our own standpoint through large glasses, but we are trying as best we can to reach the center. We are honest in our endeavors to reach the truth, and we are getting at it more and more. While the paper took a pessimistic view regarding some things, it was simply for your discussion, and I am pleased with the discussion that the paper has elicited.

Several gentlemen have spoken along the line of treatment that a patient should receive from a dentist when he calls for emergency treatment. It is a delicate question to know just what to do. It puzzles us oftentimes to know how we may speak the truth and speak it in kindness. We can oftentimes speak the truth exactly, and speak it with a spirit of kindness. We do not try to stab our fellow brother in the back. We want to encourage him. We want to stimulate each other along these lines.

We should simply practice the golden rule. We cannot do anything better than that. We should tell the truth with kindness, and with that charitable spirit which we would like to have shown to us under like circumstances.

I was pleased with the spirit of Dr. Newkirk's remarks. All of us like optimism, but we are governed largely by the peculiar atmosphere which pervades each man and his surroundings. How true it is that we make our own environments. We may do good as we go along by stretching out a helping hand. We do ourselves no harm whatever by doing this, and it is simply a manifestation of the law of love and kindness.

Dr. TRUMAN W. BROPHY (closing): I am a little surprised that my paper should have elicited so much discussion. I feel grateful to the gentlemen for giving it the kind consideration that they have done. In regard to the remark made by Dr. Freeman, I did say that who ever made a critical examination of the proximal surfaces of teeth must secure space, and I am not one of those who believe in adjusting appliances and rapidly crowding the teeth apart. I have seen too many bad results from that kind of treatment. I am satisfied it is not possible in many cases to make a good proximal filling without securing space. Many times where

caries is extensive the teeth will interlock, one will drop into the other. If you apply a separator between teeth of that character and attempt to crowd them apart you subject the patient to more pain than if you were to use wax tape and pry them apart. You may take two or three days to do it. If you do that it will not cause any discomfort; whereas if you resort to immediate separation you will injure the parts and the injury cannot be overcome by the lapse of time.

Dr. FREEMAN: Do you not consider that injury is done by the use of wedges?

Dr. BROPHY: Yes, a good deal. I have seen many cases of necrosis of the alveolar process by rapid wedging.

Dr. FREEMAN: Have you seen any injury to the alveolar process from wedging by slower methods?

Dr. BROPHY: Yes, I have, where cotton has been packed in, and made its way to the alveolar process and destroyed the soft parts. I would not call that scientific or good practice. As to the use of slow wedging, even a piece of cotton saturated with sandarac varnish and thoroughly incorporated with it and placed in between the teeth will cause sufficient separation without much discomfort to the patient. If you want to be a little particular, let some carbolic acid be incorporated into the varnish so as to keep it clean. It has no offensive odor. If you undertake to wedge too quickly you create mischief.

Dr. PRUYN: I desire to call the attention of the society to a new antiseptic—China salt. It is one of the coal tar derivatives, and it may be procured from Mr. Rhode, on North Clark Street. It is used in $1\frac{1}{2}$ to 3 per cent solution. It seems to be a wonderful antiseptic.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

A NEW MOVEMENT IN ILLINOIS.

A plan is now on the tapis to organize a few small societies in towns within a radius of one hundred miles from Chicago, to be called Auxiliary Societies of the Odontological Society of Chicago. This will take in cities like Joliet, Aurora, Elgin, Michigan City, Milwaukee, and perhaps a few others. Dentists in these cities will be on the lookout for "walking delegates," as the movers are in earnest about the establishment of such coteries of men, for their own good and that of the whole people whom they serve. Information on this subject may be had by addressing Dr. C. N. Johnson or Dr. L. L. Davis, Chicago. The Odontological Society of Chicago has been in existence nearly fourteen years, and now feeling old enough to stand alone wishes to gather in all the good material to be found so near Chicago. Will you come in when you are called upon?

DENTISTS IN THE ARMY AND NAVY.

Elsewhere in this issue will be found a letter on the above subject.

It seems that no argument should be necessary to convince army officers or surgeons of the vast benefits to the service that would accrue from having the teeth of soldiers and marines properly attended to in times of peace as well as in times of war. If we had this matter in charge we would employ some one to get the assent of the general of the army and the commanding admiral of

the navy, the war and navy secretaries and the surgeon-generals of the navy and army, and then have a bill introduced by a senator of standing in the senate, so that the matter would be attended to promptly. Unless the officials above spoken of are in favor of such a measure no amount of lobbying will do any good toward the furtherance of the object. After all, the question of rank will be the stumbling block, as it has been in the past. Any rank less than that of second lieutenant or assistant surgeon would not be accepted by our profession. The rank of hospital steward or sergeant would not do for us after having spent three or four years in the study of dental surgery to attain such a position in the army and navy.

THE CLINIC AND ANNIVERSARY MEETING.

The thirty-third anniversary and clinic of the Chicago Dental Society, which was held February 1-2, was on all sides a pronounced success. The visitors began to arrive as early as Friday before the meeting opened. Nearly every clinic announced was performed by the original operator selected or by a substitute. Many of the prominent dentists from other cities and States were present. All of the papers were read and the meeting closed with a banquet on Tuesday evening when about 150 were seated at the tables. Everything went off harmoniously and we believe that all were benefited by the rest from daily cares of professional life. The variety of the operations performed and the close interest manifested go far to show that every one is on the alert to pick up new points and absorb those already well known as fixed principles of practice. We are sure that none of our home men or those from abroad went away not feeling repaid for the time spent in coming to the clinics. We hope that Chicago or some other large middle city will hold another clinic next winter equally as large and profitable to the onlooker.

WELD'S NEW (?) METHOD OF DISINFECTION AND FILLING OF DIFFICULT ROOT CANALS.

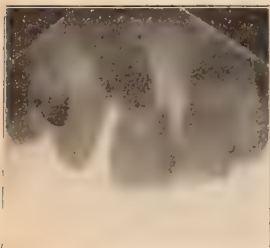
On page 20 of the *Dental Cosmos*, 1897, is an article by Dr. Geo. W. Weld on "Disinfectants and the Chemico-Metallic Method of Treating and Filling the Difficult Root Canals of Semi-Devitalized Teeth."

When the pulp is dead is a tooth semi-devitalized or is it

dead? The author assumes, at some pains, to explain a process which does not take place in the root with something which he does not disclose, and then calls it science. Any chemico-metallic method for disinfecting the contents of a tooth root which allows the residue of putrescent matter to remain within it is not scientific in the sense that we understand the definition of the word science. We would not call attention to this paper at all if it did not occupy such a prominent place in a journal of such wide circulation as the *Dental Cosmos*. The article bears its own condemnation, as it is well known that an acid, even "if chlorin is added," will attack the interior of the root before it does a "sensitized" alloy of tin, silver and zinc. How much longer will we be compelled to listen to such absurd propositions as the above, bearing the label "science."

THE MISSISSIPPI VALLEY DENTAL ASSOCIATION.

We have not received a notice of the annual meeting, but we suppose that it will take place about the usual time, the last of March or early in April. The committee has been engaged for some time in preparing for the next meeting, and it is expected that it will prove a roaring success. Drs. J. R. Callahan, L. E. Custer and M. H. Fletcher are in charge of the program.



DR. CATCHING'S CUT.

Herewith is given a substitute for the execrable cut used on page 22 of the January issue of the DENTAL REVIEW; with our apologies to Dr. Catching.—EDITOR.

REVIEWS AND ABSTRACTS.

TO THE DENTISTS OF THE UNITED STATES.

At a recent meeting of the Ohio State Dental Society, a resolution was adopted advocating the employment of dentists in the United States army.

This resolution refers briefly to the necessity for dental services among the enlisted men, recommending that Congress adopt such measures as will provide this special service; also recommending that every dental society in the land adopt a like course in furthering the interests of humanity.

The resolution also provided for the appointment of a committee of one empowered to represent the Ohio Dental Society in this matter.

This government expects its soldiers, at all times, to render prompt and efficient service, and demands, primarily, that the recruit be physically sound. It has an established standard, and in order to prevent other than those possessing this standard from being accepted, subjects each applicant to a medical examination which determines his fitness or unfitness to serve in the army of his country.

Furthermore—not content with this preliminary examination, the government attempts to maintain this standard, and environs the soldier with comfortable and sanitary quarters, furnishes sufficient and wholesome food, exacts exercise and personal cleanliness, in short, throws about him every safeguard known to science for the perpetuation of his physical welfare.

Furthermore, should he be stricken by disease or disabled from any cause, he is cared for in modernly equipped hospitals, and attended by skillful surgeons. Thus every need seems to be provided for.

Is this absolutely true? How about his dental organs? Surely the soldier is human; therefore his teeth are an important part of his physique, and if they become diseased, or are extracted, his whole organism suffers, more or less, as a consequence. It seems not a little strange that our nation should not before this, have included in its medical service, the treatment of teeth.

Granted that the entrance examination is thorough, and includes in its requirements the possession of a sound set of teeth,

there still remains a susceptibility to the insidious process of dental caries, which is no respecter of persons, and has no limit. Diseases may come and go, but dental caries when once begun, like the brook, "goes on forever."

The mere act of passing from civil into military life does not render a person immune from this evil, and it is well known that those thus afflicted suffer greatly and are indeed, from this cause, often totally disabled for a longer or shorter period from discharging their regular duties.

Therefore, it seems only reasonable, in view of these facts, that some adequate provision should be made to supply this need in supplementing medical science, thereby improving, and to that extent completing the medical service of the U. S. army.

Thus far, the only remedial process at the soldiers' command is the extraction of offending teeth—the operation generally being performed by the hospital stewards, men without dental training, from whom it would be unreasonable to expect the necessary knowledge and skill to successfully practice this branch of surgery.

Even if they were expert extractors of teeth, the immediate result of their operations would be the loss of what were intended for useful organs, the certain impairment of masticating facilities, and who can foretell the ultimate effect upon the whole system.

Indifference to the needs of her servants is not in keeping with the generous policy which usually characterizes this nation; therefore, the dental and medical men of this country, by virtue of their knowledge of existing conditions, should earnestly appeal to every member of Congress to aid in the passage of a law that will supply this glaring insufficiency. Dentists, as members of the examining boards, would undoubtedly be valuable acquisitions in preventing the admission of men with defective teeth, in this particular alone rendering valuable service.

Furthermore, in cases of gunshot wounds and other injuries about the mouth and face, the dentists' special knowledge of this region, together with his skill in devising and adapting appliances that may be necessary for their treatment, qualify him for managing this class of cases, which the vicissitudes of war render needful.

Altogether considered, the dentist is a necessary factor no less in the army than in civil communities.

Dear reader, will you not personally lend a helping hand in this noble cause? Will you not enlist the services of your own representative in Congress to support an enactment with this end in view? If this matter is brought to the minds of those who rule the affairs of our nation, we may hope that they will add this branch of healing to their otherwise perfect system for the care of those who are the safeguard of our frontiers and coast lines.

OTTO ARNOLD,
Representing Ohio State Dental Society.

MEMORANDA.

Why does amalgam set or harden?

When should a tooth be extracted?

Dr. Wm. H. Pancoast, of Philadelphia, is dead.

Dr. Geo. S. Nason has gone to Texas for a vacation.

Tennessee will celebrate from May 1 to November 1.

Why do you feel pain in a tooth cavity when oxychloride is used?

Oh, yes. Section G. A. Diseases of the teeth. Moscow, August, 1897. Are you going?

Very soon the Philadelphia Dental College will have a new building specially built for college purposes.

A recent writer says "Modern dentistry is producing more pyorrhœa than any other cause." Modern dentistry must be a large microörganism!

"Take an orange wood stick, cover it with wax on one end, then carry the crown to place already filled with cement."—Rosenthal.

Not many of the students coming to America have even the equivalent of an eighth grade education in their own language. What will you do with them?

Only a few were detained at home by illness. Those few were on the program, but their places were filled by able substitutes in every case. Cliniciana.

The *Dental Headlight* has a new editor. Dr. J. A. Dale, of Nashville, succeeds Dr. Henry W. Morgan, who so satisfactorily filled the chair for several years.

Dr. F. L. Platt is the new editor of the *Pacific Stomatological Gazette*. Success to him. The *Stomatologis* emanates from Philadelphia, January, 1897, Vol. I., No. 1.

Dr. H. J. McKellops showed a skeleton tongue holder for use while setting a crown or piece of bridge work at the recent clinic in Chicago. It is the best we have ever seen.

No more rubber wedges for our teeth. We prefer the slow method. One experience is quite enough. Use a separator or go slow, is the advice of one who has been there.

Infection of the tissue beyond the apex of the root is quite often brought about by the careless use of air syringes having powerful bulb attachments. Better to disinfect first, then desiccate.

Mr. —, the American consul in Berlin, was asked to furnish us with a copy of the law regulating the practice of dentistry in Germany. He replied that his fee was \$10. We got it elsewhere.

Test the powder of oxyphosphate for arsenic. Sometimes a pulp dies when the cause of death is a puzzle. Perhaps arsenic, which is sometimes found in commercial oxide of zinc, was the imminent cause.

Dr. Grafton Monroe says: I simply wish to express my appreciation of the good that has come to me and my practice by the use of the fl ext. Jamaica dogwood. Use of it after the manner of your suggestion in the 15-gtt. doses has proved a great help to many of my nervous ones. I keep it constantly on hand.

DR. JOHN W. FISHER.

Dr. John W. Fisher, a prominent member of the dental profession and an old resident of Bloomington, Ill., died February 11 after two days' illness. He was aged sixty-nine years and leaves a wife, one son and one daughter.

THE TREATMENT OF NEURALGIA.

R Menthol,
Guaiacol, of each, 15 grains;
Absolute alcohol, 5 drachms.

A small quantity of this mixture is gently rubbed over the painful spot, which is then covered by a piece of cotton. This can be repeated two or three times in the twenty-four hours.—*Journal de Médecine de Paris*, June 14, 1896.

A SOLUTION FOR THE PAINLESS EXTRACTION OF TEETH.

The *Therapeutische Monatshefte* states that the following prescription may be injected in the dose of a few drops into the gum around a tooth which is to be extracted:

R Hydrochlorate of cocaine, 3 grains;
Hydrochlorate of morphine, $\frac{1}{4}$ grain;
Chloride of sodium, 4 grains;
Antipyrin, 30 grains,
Guaiacol, 2 drops;
Distilled and sterilized water, a sufficient quantity to make $3\frac{1}{2}$ ounces.

A METHOD WHEREBY RUSTING OF INSTRUMENTS DURING STERILIZATION IS PREVENTED.

Levai (*Wiener Klin. Rundschau*, 1896, No. 31), after an experimental investigation as to the rusting of instruments, finds that the process is due to carbonic acid contained in water, and that it is not absolutely prevented by the addition of carbonate of soda, as recommended by Schimmelbusch. He states that rusting can be greatly lessened by first boiling the water before placing instruments in it,

since thus the greater part of the carbonic acid is expelled. The most efficient means he finds is to add to the boiled water 0.25 per cent of sodium hydrate, pure, containing no sulphur. During the operation, the instrument should lie in the solution thus prepared. Sharp knives placed in this solution do not lose their edge in the faintest degree.

AN ANTISEPTIC POWDER.

We are told by the *Journal de Médecine de Paris* of June 14, 1896, that the following makes a useful antiseptic powder, equal to iodoform in value, but without its odor:

℞ Powdered iodoform,
Powdered benzoin,
Powdered cinchona,
Powdered carbonate of magnesium with oil of eucalyptus, equal parts
This powder is also absolutely without danger.

ESSAYS TO BE READ BEFORE THE ODONTOGRAPHIC SOCIETY OF CHICAGO FOR THE YEAR 1897.

January, "Facial Orthopedia," C. S. Case; February, "A Method for Mounting Gold Cusps on Badly Broken Down Bicusps and Molars," B. J. Cigrand; March, "Dental Colleges," Theo. Menges; April, "The Structure of the Peridental Membrane," F. B. Noyes; May, "Some Mistakes in Crown and Bridge work," B. D. Wikoff; June, "Embalming Roots of Devitalized Teeth," J. H. Woolley; September, "Art in Dentistry," G. W. Schwartz; October, subject to be announced, Geo. J. Dennis; November, subject to be announced, D. C. Bacon; December, "Surgical Operations for the Treatment of Harelip," T. W. Brophy.

EUCAINE IN MINOR SURGERY.—BY THOMAS JEFFERSON YARROW, JR., M. D., RESIDENT PHYSICIAN, EPISCOPAL HOSPITAL, PHILADELPHIA.

The following is a brief report of the use of eucaine hydrochlorate in a series of thirty-five minor surgical operations performed in the surgical dispensary of the Episcopal Hospital, Philadelphia, service of Dr. Adinell Hewson.

Method of using: A heat-sterilized aqueous solution of the drug was used, ranging in strength from $1\frac{1}{2}$ to 10 per cent. The field of operation having been thoroughly prepared, an aseptic elastic ligature was applied and ten to thirty minims were slowly injected by a hypodermic syringe into and about the point of operation. The ligature was retained until the operation was completed.

One of the advantages that eucaine possesses over cocaine is that, while the latter drug is decomposed during heat sterilization, the eucaine is not, and retains its full anæsthetic power.

The aseptic ligature was applied, when possible, above the seat of operation, and in only two cases was any physiological action of the drug observed. These two cases had marked slowing of the pulse for about five minutes, the pulse being slow, full and strong, about 56 to 63 per minute.

Eucaine did not seem to produce ischæmia of the part, such as is observed during the use of cocaine. After the removal of ligature free bleeding occurred in nearly all the cases immediately. In this it differs from cocaine, which by its vasomotor constriction often delays hæmorrhage.

In conclusion: Eucaine may be used successfully in all of the minor surgical

operations in which cocaine has been formerly employed. Eucaine appears to have advantages in that it can be rendered sterile in solution by boiling. Its physiological effects are slight, if any, when used in moderate quantities. There appears to be no throbbing pain after operation. In the average case twenty minims of a 4 per cent solution are required to produce complete and satisfactory local anæsthesia.

There were about one hundred and fifty present at the banquet of the Chicago Dental Society the evening of February 2d.

Among those who were present at the clinic were: H. A. Smith, D. W. Clancey and H. T. Smith, Cincinnati; J. Y. Crawford, Gordon White and Henry W. Morgan, Nashville; T. M. Allen, Birmingham; E. W. Anderson, T. S. Hacker, J. E. Cravens, Alex Jameson and Geo. E. Hunt, Indianapolis, E. K. Blair, Waverly; N. S. Hoff, Ann Arbor; A. W. Diack and G. S. Shattuck, Detroit; Geo. H. Wilson and J. F. Stephan, Cleveland; L. L. Barber, Toledo; R. G. Richter, C. A. Southwell, W. H. Carson, W. C. Wendel and L. R. Esau, Milwaukee; Chas. C. Chittenden, Madison; Geo. H. Slyfield, Waukegan; Horace Warren, Iowa; R. S. Rathbun, Clinton; W. G. Clarke, Cedar Rapids; T. L. James, Fairfield; Thos. E. Weeks, Minneapolis; C. W. Jones, E. K. Wedelstaedt, G. F. Andrews, St. Paul; J. A. Kyle, H. J. McKellops, A. H. Fuller, F. F. Fletcher, J. Pfaff, P. H. Morrison, P. H. Eisloffel, J. H. Kennerly, Emma E. Chase, H. H. Keith and others; R. N. Lawrence, R. Goebel, Lincoln; C. R. Taylor, Streator; S. F. Duncan, Joliet; W. E. Holland, Jerseyville; T. G. Wonderly, Galena; A. S. Waltz, Decatur; J. W. Cormany, Mt. Carroll; A. H. Thompson, Topeka; F. O. Hetrick, J. D. Patterson, Kansas City; B. Holly Smith, Baltimore; J. G. Templeton, Pittsburgh; K. R. Davis, Springfield; J. A. W. Davis and E. C. Stone, Galesburg; G. D. Sitherwood, Bloomington; C. R. Baker, Davenport, W. W. Moorehead, Aledo; J. B. Monfort, Fairfield; I. P. Wilson, Burlington; Geo. F. Cheney, St. Johnsbury, Vt.; M. L. Hanaford, M. R. Harned, Rockford; S. H. Guilford, Philadelphia; E. H. Allen, Freeport; L. E. Custer, Dayton; G. V. I. Brown, Duluth; C. E. Esterly, Lawrence, Kan.; E. H. Angle, St. Louis; W. E. Griswold, Denver; W. H. Richards, Knoxville, W. W. Shryock, M. A. Mason and J. S. McCurdy, Fort Wayne; S. M. Cummins, Elkhart; C. J. Tibbetts, Quincy; Decourcey Lindsley, St. Louis; C. H. Rosenthal, Cincinnati; F. J. Patterson, Mendota; Dr. Kyle, St. Paul; Dr. C. B. Sawyer, Dr. Powell, Jacksonville; Dr. D. E. Coulson, Galesburg, and many others.

TO DISINFECT FURNITURE.

Furniture and woodwork generally may be completely disinfected by rubbing with flannel on which a few drops of "Sanitas" Oil have been placed, and should always be used for renovating chairs, tables, etc. In addition to giving a good polish, it at once destroys any disease germs that may be attached to the furniture, and also by giving off the vapors of "Sanitas" it helps to purify the atmosphere of the room for several days afterward.

OBITUARY.

FRANCIS PEABODY, D. D. S.

Dr. Peabody was born in Boston, Mass., January 22, 1833. He came to Louisville when he was yet a young man and began the study of dentistry with his uncle, Dr. W. H. Goddard, who was one of Louisville's distinguished dentists in the early days. After studying with his uncle for some time he went to Cincinnati and graduated in his profession from the Ohio Dental College.

He married before the war and went to Tennessee with his wife and two children. During the war he lived near Nashville, and, while he took no active part on either side, he sympathized with the lost cause. When the union troops invested the town in which he lived he was suspected of being a confederate spy and thrown into military prison. The authorities were quick to learn his innocence and he was released with all due amends. His wife and little boy died shortly afterward, so Dr. Peabody returned to Boston with his little girl, whom he gave into the care of his sister. She is still living there.

Then Dr. Peabody returned to Louisville and again began the practice of his profession with his uncle, Dr. Goddard. He remained here until 1871, when he went to Brazil and practiced his profession in Rio Janeiro. He again returned to Louisville and remained here until his death. In 1882 he married Miss Nannie E. Williams, who, with two interesting children, survive him.

Dr. Peabody was perhaps one of the best-known dentists in Kentucky. He was elected to the faculty of the Louisville College of Dentistry in 1888 and has been president of that institution for about six years. He has been president of the Kentucky State Dental Association and chairman of the Board of Censors, both very distinguished honors. He was a member of the National Association of Dental Faculties, American Dental Association, Southern Dental Association and Mississippi Valley Dental Association. He was elected president of the Falls City Dental Club last year. He was an enthusiastic student and able teacher and a practitioner of rare skill and ability.

At the Louisville College of Dentistry and the Hospital College of Medicine a committee was appointed to draft suitable resolutions.

Following is the action of the committee:

Prof. Peabody was the champion of many advances in the dental education within the period of his professional career. He always insisted upon the intimate relation of dentistry to the profession of medicine and maintained that the ethics of the medical profession necessarily included the profession of dentistry. He was an enthusiastic student, and able teacher and a practitioner of rare skill and ability.

Resolved, That we deeply deplore his death and feel keenly the loss of his wise counsel and the great loss of his services to this college.

Resolved, That in our judgment the dental profession has suffered the loss of one of its ablest members.

Resolved, That the college buildings be draped in mourning for thirty days, and that the buildings be closed on the day of the funeral.

Resolved, That a committee communicate with the family of the deceased and make suitable preparation for receiving the remains on arrival at the depot and aid in the arrangements for the funeral.

Resolved, That the joint faculties and students attend the funeral in a body.

Resolved, That we tender to the family of our deceased colleague our profound sympathy and condolence.

Resolved, That a copy of this action be furnished the family of the deceased, and that it be made a part of our permanent records.

Resolved, That a copy be furnished the press for publication.

EDWARD M. KETTIG,	} Committee.
JOHN A. LARRABEE,	
HENRY B. TILESTON,	
THOMAS HUNT STUCKY,	
DUDLEY S. REYNOLDS.	

FILLING OF CHILD'S TEETH NO URGENT NECESSITY.

While extracting of a tooth in relief of a toothache may be reasonably within the agency of a person with whom a child is temporarily residing apart from its parents to require, and thus obligate the father to pay for, the Appellate term of the Supreme Court of New York holds, in *Ketchum v. Marsland*, Nov. 25, 1896, that such agency does not extend to the employment of a dentist to fill and regulate the position of such a child's teeth, it not being deemed such an urgent necessity as to warrant such a course. However, the court holds the father liable in this case because of the ratification of what was done by not communicating any dissent to the dentist during three years that elapsed after he sent in his bill.

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HEREDITY.*

BY THOS. L. JAMES, D. D. S., FAIRFIELD, IOWA.

It could scarcely be expected that the writer, whose researches have been narrowly limited with reference to heredity, should be authority upon the subject, nor is it presumed that a subject comprising so vast a field could be elucidated in a short essay. It would be presumption in one of limited experimental knowledge to make many positive statements with reference to heredity upon his own responsibility. Therefore we rely in part upon the statements of those of reputed ability. Many might view this subject as being entirely foreign to the province of dentistry or to the curriculum of studies necessary to our profession. We cannot see, however, but that it would be wise, nay, more important, to the student who is expected to study, directly and indirectly, all that pertains to dental science that he embrace in these studies that of heredity.

This subject has attracted the attention of thoughtful people since civilization began. The possible transmission of conditions, moral, physical and intellectual, natural and acquired, anomalous, mutilation, etc. You will readily appreciate the width and depth of this subject.

We occasionally meet with individuals who have simply read accounts of a few observations relating to this subject, and who imagine that they have thought the whole subject through when they have simply learned a few curious cases where strange peculiarities have developed in the offspring that characterized the parent, and perhaps of a few monstrosities. There are those, too, who assert that there is nothing to be gained from research and study in this line. In fact we were led in part to renew our studies

*Read before the thirty-third anniversary clinic of the Chicago Dental Society.

upon this subject, to review the productions of recent authors upon the study of hereditary transmission, to satisfy ourselves as to the correctness or incorrectness of the statements of one of our profession—one who has been honored with the highest place within the gift of the American Dental Association. We did not, at the time, nor do we now, think he was justified in making the assertion, in substance, that little attention would hereafter be paid to microorganisms as factors of disease; that the subject of microorganisms would be relegated to a place with the subject of hereditary transmission. Either this gentleman is entirely mistaken or the results of researches as published and investigations made by those of highest scientific attainments are quite misleading. For everything points in the direction that this subject is a very live one, and we are unable to discern any abatement in the pursuit of this study.

It is true there are many unsettled questions relating to this subject, *e. g.*: the nature and origin of congenital variations, what the causes and the direction they follow, etc. Again, there has not yet been explained the representation of types as shown in atavism, and in normal inheritance, how nature is placed in the nucleus of the fertilized ovum, etc. But this only causes investigators to become more zealous in their efforts. We see no evidence of cessation or relinquishment; no indication that the subject is being ignored.

Prof. Brooks, of the Johns Hopkins University, once said that "the development of an animal with the complex and beautiful adjustments, the instincts, habits and individual traits of its parents is one of the most wonderful phenomena of the material universe."

The study of heredity, in its entirety, embraces that of evolution in a great measure, since they are so blended, that they must go hand in hand. This of course, taken in embryology, from its very beginning, and even to the constituents of the spermatozoa and ova, some of the older authors believed that the egg contained a minute latent chick, or whatever was to be produced, and that fecundation and incubation simply caused the germs to absorb whatever was necessary to its development and activity; and that the invisible animal was made visible in this way. Again, those of another school, believed that the germ was contained in the seminal substance, and it was supposed that a minute animal, *i. e.* an animal in miniature, was contained therein.

But more recent investigations have proven that the embryo is gradually built up from the egg. We know, too, that generally the eggs of animals are alike microscopically; that the body is gradually built up by cell division, and cells that are widely apart, may form a single organ, for example, the teeth. In our study of embryology we can see no evidence that any of the organs are in miniature within the germ. But while the embryo shows no signs of being preformed in the germ cell, yet we are convinced that it is predetermined that the egg must possess a certain definite substance for the development of different parts for the organizing of the body.

Much has been done recently to establish the theory of germinal localization which has been advocated by some of the foremost students of development; while all admit that though the substance of a cell may appear homogeneous under the microscope, there is certainly something established which is not visible. In the words of another, "the egg-cytoplasm has a definite molecular organization directly handed down from the parent."

From some experiments recently made with reference to germ localization, it has been found that in some of the lower animals at least, the medial plain of the body of the future animal is marked out from the beginning of cleavage, which may show that the materials destined for right or left side of the body are situated in the corresponding hemisphere; for Roux, in experiments on frogs, on killing one of the two-cell stage, by means of a heated needle, observed that the uninjured half developed into a perfectly formed half larva. Through all of this author's writings, as well as through others, runs the leading idea that the germ is definitely organized before development begins; that organization precedes cell formation.

Huxley says, "It is certain that the germ is not merely a body, in which life is dormant or potential, but that it is itself simply a detached portion of the substance of a preëxisting living body." The wonderful formative energy of the germ is not impressed upon it from without, but is inherent in the egg as a heritage from the parental life of which it was originally a part.

Wilson, in speaking of the cell, with reference to its development and inheritance, says that "a cell can carry with it the sum total of the heritage of the species; that it can, in the course of a few days or weeks, give rise to a mollusk or a man, is the greatest marvel of biological science."

Of course we are, and may ever be, unable to see life as it really is, but as some one has said: "We come nearest to this invisible form of energy, when, with some of the advanced investigators, we strip the life processes of all their accessories, and view them in their simplest external form." Pardon us for saying, that in our opinion, some of the teachers in medical and dental science, lay too little stress upon the important study of biology. We can not fully comprehend pathological or disordered conditions, until we understand pretty thoroughly normal conditions.

With reference to the germ cells we feel that we can do no better than to quote Prof. Osborn, in his very fair summing up statement with reference to this matter. He says:

"The material substance of hereditary transmission is the highly coloring protoplasm, or chromotin in the nucleus of the germ cells probably connected with a certain form of archoplasm or dynamic protoplasm outside of the nucleus. Before conjugation and fertilization, the hereditary substance of both the male and female cells is reduced to one-half that found in a typical cell. The substance is, however, first doubled and then quartered, the meaning of which process is not understood. There is a difference of opinion as to whether the maternal hereditary substance during fertilization are fused or lie side by side; also as to how the substance is distributed throughout the tissues—whether en masse or by qualitative distribution. No connection between the germ cells and the body cells is known, but the facts of heredity seem to render such a theory necessary. The facts of heredity support the theory of a continuous and specific form of protoplasm as the basis of repetition of types. The laws of variation or anomalies lend support to the theory of hereditary transmission of individual variations."

In regard to acquired heredity, we can but infer that this theory is gaining ground—gaining advocates. However, it is not clearly settled, but it seems true that almost all of the thoughtful, observing physicians are found to be advocates of this theory. Those who have carried out and repeated the experiments with reference to transmission of mutilations, as performed probably first by Dr. Brown-Sequard, are upon the side of hereditary transmission of mutilations. These experiments consisted in operations upon certain nerves of Guinea pigs, which have shown transmitted effects.

Many efforts to transmit mutilations have been unsatisfactory. However, a man by the name of Lockwood has been able to produce a generation of tailless white mice by carefully selecting healthy animals and breeding only the fittest, clipping their tails. If we do not mistake his experimentations were carried on through ninety-six generations. These animals were selected because of their rapid breeding. When they are thirty days old they begin to breed, and breed every thirty days, requiring less than eight years to produce ninety-six generations.

In conversation with an extensive breeder of cattle we learned that it was possible to breed hornless cattle by dehorning many generations, as is the custom at present, for he had in six generations produced a generation of hornless cattle. From these results we might infer that anomalous generations may become typical in much later generations. Therefore a typical part may become an anomaly, and an anomalous structure become typical.

Prof. Osborn, of Columbia College, cites the example of the supra condylar foramen of the humerus as once being typical and is now anomalous. The retardation of the wisdom tooth once anomalous, is now typical. The same applies to races—an anomaly in the white, such as the early closure of the cranial suture is normal in the black. It has been suggested that by removing the vermiform appendix from a number of generations, we might be rewarded with the absence of the same in subsequent generations.

The tendency of posterity is to follow antecedents. Efforts to avert, modify in proportion as time and environments are afforded, and until a new type is thoroughly established, there is a possibility of a return to the original. Even in the vegetable kingdom, domestication is followed with improvement or otherwise; but when the original conditions are permitted to have exercise, a tendency to return to the primitive is readily observable. Much could be said relating to the influence of the parents upon the general character and constitution of the offspring—upon the laws of nature coöperating in the propagation of species—the many influences exerting force toward the modification of heredity—the conflict of elements which take part in genealogy, etc., etc.

But let us treat upon thoughts that are even more commonplace, points that may be disclosed to any, if but little more than a casual observer. We might cite examples of inherited tendencies and inherited actualities, which are often apparent when the

mother has craved, without satiety, some particular kind of food or drink, for considerable time during a period when the fœtus is most susceptible to influence. The offspring will almost certainly inherit a more than usual fondness for that particular thing for which the mother craved. So also, if the mother, at the period alluded to, be forcibly repulsed by anything—if she abhors or loathes any particular thing which may influence the system, the tendency of the offspring is to dislike it.

Many instances have been known, some of which have come under our own observation, where one child of a family revolts at the thought of a dental operation much more than its brothers and sisters—not because of general nervousness, for the same child has displayed heroism and endurance with reference to physical suffering in other ways—but because of actual inheritance. These peculiarities and idiosyncrasies may be confined within the generation in which they originate, but there are peculiarities and characteristics which do not cease—abnormalities and appetites that tend toward perpetuity. We have known three generations to present supernumerary teeth, also three generations to be minus the left superior cuspid tooth. Many and varied are the peculiarities along this line that may come under our observation if we are but observing. The matter of deformities in the way of irregularities of teeth, consequent upon contracted arches, resulting from combination of circumstances, we might note just here.

For example, the inheriting—in one or some offspring—the large teeth of one parent, and the small jaws of the other. While we know this to be true, yet no more true is it with reference to the dental organism than in the general make-up in voice, form and features, since the child inherits one peculiarity from one parent, and one from another. Instances could be given of interrupted collateral inheritance of deformities and peculiarities originating, but would not be noticed in the first, second and third succeeding generations, but in the following generations the same peculiarities would again be manifested as strikingly as in the one which they originated, such as a peculiarity of expression, some malformation. The reason for this cannot yet be satisfactorily established.

We may be able to account for dissimilarity in children of the same parents. They may have been influenced by different impressions, such as nutrition, health, temperature, emotion, etc., etc.,

except, perhaps, in the case of twins. Even in twins great dissimilarity is often presented. This has been attributed to conception having taken place in the different ova at different instants of time, thus showing that a very short interval of time may be productive of change in this particular. It is generally believed that the child inherits its physical peculiarities, structure, size, temperament, etc., from the parent of the opposite sex. We cannot say that this holds good with reference to tooth structure.

From a record of twenty-six families, sixteen of these, the mothers having inferior and the fathers excellent tooth structure the offsprings (of which 70 per cent were females) presented very inferior tooth structure, while in other respects were like the male parent. True this record affords too few cases upon which to base a positive opinion, but they have come under the writer's notice, and offer something in the way of proof that the quality of tooth structure is not always transmitted to the opposite sex.

However, the rule or reversion even here held good to an amazing degree; for in cases when the teeth of the fathers of the mothers were good the daughters teeth were usually good and *vice versa*.

One of the most pronounced examples of hereditary irregularity of teeth came to my notice since beginning this paper. The father and mother both having large teeth and contracted arches, their teeth irregular and out of place, three of their children presented themselves for dental operations. The oldest, a Miss of sixteen, had no teeth that properly occluded the upper bicuspid and first molars; passing, when attempting to occlude, inside; that is, the labial and buccal surfaces resting against the lingual surfaces of the teeth below, while the incisors were equally out of normal position. The teeth of the other two children were equally correct.

THREE PATHOLOGICAL CASES.*

By I. P. WILSON, D. D. S., BURLINGTON, IOWA.

Case 1. Mrs. S——, age twenty-eight, lived on a farm; had always enjoyed good health. Last April she suffered severely from nervous toothache in first left superior molar. Home remedies were applied, and after a time the pain subsided. The pulp had perished. Soon after the tooth became sore, the adjacent parts inflamed and the face swollen. After intense suffering for some days the acute form subsided, leaving a dead, heavy pain in the malar region.

A dentist in a neighboring town was then consulted, and the tooth extracted. This was followed by a gush of pus from the antrum which she described as being of a most sickening character, causing nausea during the rest of the day. The discharge continued through the alveolus for nearly a week, when there was a cessation of pain, and finally the socket closed. But little discharge had at any time taken place through the nose. Some months passed, when the pain in the cheek and in the ethmoid region again appeared. She grew rapidly worse, and after receiving medical treatment for some time with no beneficial results, she returned to her parents' home in our city, that she might have her mother's care.

Other physicians were summoned, who took a great interest in the case, but were unable to find the hidden cause of the disease, or make a satisfactory diagnosis of the case. In two weeks from the time of her removal she died of septicæmia.

A post-mortem examination was held, the brain removed and the horizontal plate of the ethmoid broken down, when the cells of that bone were found to be infiltrated with corrupt matter. The two large air cavities of the sphenoid were also found to be filled with pus. The frontal sinuses were apparently in a normal condition. The examination was about to be concluded when one of the physicians kindly suggested that the case would be of peculiar interest to the writer, and asked that I be sent for.

On my arrival I inquired about the previous condition of her teeth, and was told that the dental organs had not been suspected as having anything to do with the disease. The antrum was then

*Read before the Anniversary Clinic, Chicago Dental Society, February 1, 1897.

opened and found to be filled with a mass of thick, cheesy corruption.

At the suggestion of the physician in charge, I accompanied him to another room to interview the mother, and from her we procured the foregoing history of the case. It is due the physicians who attended the lady in her last illness to state that the apparent good health of the patient for a time after her first illness had led her family to disassociate the first stage of the disease from her last sickness, and so her physicians were not advised of previous dental irritation.

I ought to state before dismissing this case that the septum of the nose was deflected to such an extent as to almost entirely close the nostril on the affected side, so that the ostium from the antrum was almost if not entirely obstructed. This, of course, accounts largely for there being no discharge from the nose, and the consequent engorgement of the antrum.

Case 2. Dr. D., age thirty-seven, a clergyman, was advised by his physician to give up his work and travel, because of cerebral difficulty, softening of the brain being suspected. A trip abroad was planned, and in company with an attendant he sailed for London. Immediately on arrival, he was placed under the treatment of a noted physician of that city. A few weeks elapsed, when he complained of an aching tooth in the lower jaw. In a few days his face and neck became greatly swollen. His suffering was intense, and was attended, as is usual in those cases, with chills and fever.

A large poultice, covering the side of his face and neck, was ordered by his physician. Days passed without relief. A lancet was at length used, and a quantity of pus discharged. The swelling in the cervical region, however, only partially subsided. His condition grew rapidly worse, until death from septicæmia relieved the sufferer.

His attendant was a man of intelligence, and of close observation, and from him I learned the above facts at the time of the burial at Bloomington of this State. From what I could learn I am satisfied that pus had pocketed at different places between the muscles of the submaxillary region. A dentist was not called, nor did the tooth receive any direct treatment.

In this case, as in the preceding one, there is much to be read "between the lines."

Case 3. Mrs. P., age sixty eight, of previous good health, and with excellent family history.

I was called in consultation with attending physicians. The case had been under treatment for more than a year. Morbid growths had been repeatedly removed of late, from the nose. The cheek was considerably enlarged. A gold plate had been worn for two years, the rim of which was buried in the aggravated buccal tissues, making a cut nearly two inches in length, and a quarter of an inch in depth.

These symptoms led me to believe the antrum to be the seat of the disease.

At the request of the physicians, I opened into that cavity through the cut made in the soft tissues by the plate.

The posterior and superior portions of the sinus were found to be well filled with a spongy growth that bled freely on the slightest touch. There was no difficulty in irrigating the unoccupied portion of the cavity, the water passing freely into and out of the nose.

The plate was now, for the first time, laid aside.

Believing the disease to be of a malignant character, I advised the lady to go at once to a Chicago hospital for treatment at the hands of a skillful surgeon. But she and her friends, as well as the physicians who had attended her, suggested that we wait for a time for further development. I accordingly visited her home daily for three weeks, each time cleansing the passage from the antrum to the nose with medicated washes, which afforded considerable comfort at the time. I discovered, however, that the disease was rapidly gaining ground. Polypoid growths were continually forming in the nose, which her physician from time to time removed.

An angry appearing tumor of a cauliflower form, commenced bulging through the opening into the mouth. The cervical glands became involved.

After carefully studying the case in the light of our best authorities, I pronounced the disease to be of a carcinomatous nature, and to verify my conclusions I sent a clipping from the growth to a Chicago microscopist for examination, requesting a prompt reply, which came by wire in the following words: "Carcinoma—Prognosis grave."

I advised the friends of the unfortunate woman to take her at once to Chicago, which they did.

Prof. Senn was consulted, and confirmed the diagnosis given. An operation was determined upon as the only possible hope of lengthening her life. An enlarged cervical gland was first removed, followed by excision of the left superior maxillary.

The patient rallied from the operation and appeared to be doing well for a few days, when facial erysipelas set in and death soon followed. Prof. Senn, I am informed, regarded the case of traumatic origin. Her brother, Dr. Smith, a prominent physician of Wellington, Ohio, who attended the operation, informed me by letter received since writing the above, that his sister "had no heredity inviting the conditions and cause of her death."

The question of peculiar interest to us as dentists, is the cause of the malady. Was it the result of long and continued irritation, resulting from an ill fitting plate? I am inclined to that opinion.

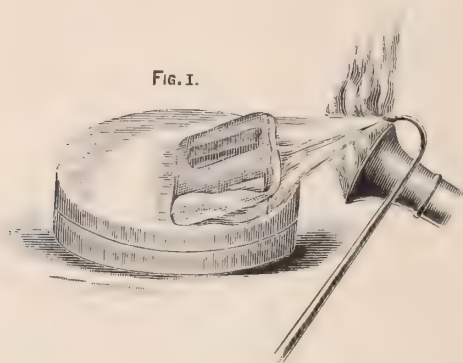
SOLDERING.*

BY A. H. PECK, M. D., D. D. S., CHICAGO, ILL.

As time goes by it becomes more and more difficult for me to select wisely a subject on which to write for a dental society. However, knowing as I do that anything along the line of practical dentistry never fails to command the closest attention, and always elicits full, interesting and instructive discussion; and also, that during the past two or three years, if I have been asked the question once—and I affirm that I have—it has been asked me two hundred times "How do you solder cases and never break the teeth?" and also, that only a few weeks ago while being shown through the various departments of one of our sister institutions of learning, and while in the prosthetic laboratory observed students, who were following the instruction they had been and were receiving, trying to flow solder on the backings of teeth by directing a fine pointed flame into the bottom of a well-shaped opening at least half an inch deep, and this too while the temperature of the opposite side of the massive investment was more frigid than otherwise—and the most curious part of all is that they would stand and wonder why the solder forms into small globules that persist in playing tag with one another instead of spreading out evenly over the surface of the backing as was so much desired; and also that not long since a prominent practitioner coming to the office and observing a case invested, heated, soldered, cooled and removed from the investment in less than half an hour seemed astonished and said that he never pretended to give less than

* Read before the Chicago Dental Society.

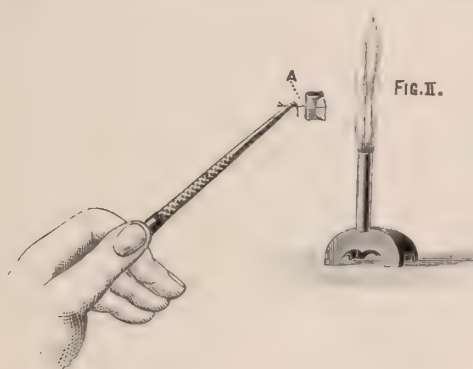
thirty-six hours time to a solder case even though it were only a single tooth crown, placing the case in the investing material at night, leaving it till the next morning to harden, then placing it on the fire to dry throughout the day, flowing the solder the last thing before leaving the office in the evening, and finally placing the case in a measure of hot sand to gradually cool during the night. And would you believe it, he said with an expression of mingled innocence and astonishment "I frequently find broken teeth after exercising all this precaution ;" and also because there is absolutely nothing that arises in our experiences as practicing dentists that will so quickly and completely bring from its hiding place the old blasphemous Saul of Tarsus spirit, that is in us all to a greater or less extent, when after having spent long hours of



patient weary toil in the construction of crowns, bridges or plates to find a tooth or teeth broken on opening the investment after soldering ; and also because the writer does not remember when last he caused the breaking of a tooth in a case of soldering, and please do not consider me boastful in making that statement. In my early youth I learned a lesson in this connection that I have never forgotten. I did a considerable amount of bragging as to what I would do and would not do, etc., to a certain other youth who had done me, possibly, an imaginary wrong, but who, when the meeting did come, administered unto me a most beautiful and sufficient thrashing—and ever since that time I have remained free from the ways of the braggart. The above are among the principal reasons why I decided to write on this subject.

The points necessary to be observed and as I have found them

in my experience that one may become uniformly successful in soldering are indeed few and simple. First the backing should be so shaped and arranged on the facing that in cooling the contraction of the metal will, at no point, bind or exert undue pressure on the porcelain. Second, no flux or borax should be permitted on the porcelain. Third, the case should be gradually heated till the investment is thoroughly freed from moisture, after which it should be brought to as high a temperature as possible on the stove before resorting to the use of the blowpipe. Fourth, the case should be so arranged on the soldering block that the flame can be directed on the teeth themselves, thus heating the latter in advance of the metal. (Fig. 1.) The flame, directed on the case with the blowpipe, should be large and the entire mass should be brought



to a degree of heat, very nearly if not quite equal to the melting point of the solder itself. Then directing the flame on the solder, and slightly reducing its volume, the latter will flow or spread over the surrounding parts in a manner that will invariably bring joy and gladness to the heart of the most exacting. And fifth, set the case down just as it is and permit it to have its own way about cooling off, and I see no reason why you should be troubled with broken teeth.

I believe the actual cause of the breakage of teeth in most instances is the fact that the metal is unduly heated before the porcelain, the resulting expansion of the platina pins causing the facing to check.

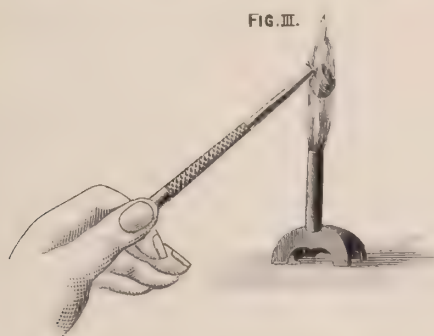
A soldering case should be prepared for heating in the following manner: Having removed the wax with boiling water, and

this may best be done by not placing the case in the water and boiling it, but rather by holding it with a suitable pair of tongs and pouring the water on the wax at a little distance. This thoroughly done the parts to be covered with solder should be carefully washed with chloroform that all oily substances remaining shall be completely removed. The case should be thoroughly fluxed and I prefer the wet flux to the dry powder in every case. Take a piece of hard borax and grind it up with water on a piece of ground glass and apply with a camel's hair brush. The solder should be cut and the pieces after having been thoroughly covered with flux placed in position in sufficient quantity, or as nearly so as one is able to judge, to complete the work. This done the case is ready to be placed on the fire for drying and heating. The mixture for an investment which I consider better than anything else is composed of equal parts of sand, silver sand much preferred, and plaster with a sufficient amount of chopped asbestos. This forms a hard mixture and one that does not check or in any way change form on being heated. It is positively unnecessary that an investment be made large and bulky. Only just enough to afford sufficient strength to hold the different parts in proper apposition the one to the other is all that is required. More than once I have seen different individuals soldering a single crown in an investment two or three inches square. In such a case my investment is seldom larger than three-fourths of an inch square and frequently as thin as paper over the porcelain itself.

I do not care to discuss the various methods of applying the heat, etc., in soldering, for what is successful in the hands of one might not be in the hands of another. Each individual has his own method of producing results, and so long as he is successful let him continue with his methods. So far as I am individually concerned I wouldn't give a farthing for all the foot machines that were made. As I have no trouble in soldering any case with the mouth blowpipe, while my neighbor, perhaps, would be unable to do anything without the bellows.

And now I come to the statement that in all cases of soldering, especially crowns, in which it is possible to retain the porcelain and the metal portion of the crown in proper apposition by means other than an investment, that the latter is wholly unnecessary, as the only function it can possibly perform in such cases is the retention of the various parts in their proper relation—be-

cause the investment is no longer the supposed necessity as a protection to the porcelain and a preventive to breakage. In the soldering of porcelain faced bicuspid and molar crowns, in which cases the parts can be held in proper relation by means of a wire as shown in figure No. 2 and as I have demonstrated time and again in clinic and in private practice for nearly three years, and, as I shall demonstrate here to-night, the use of the investment is simply a waste of valuable time. In such cases the crown is constructed in exactly the same manner as if it were intended it should remain a shell gold crown. In passing it may not be out of place to state that the gold plate for crowns should never be finer than 22k. or thinner than 29g. Not lower than 20k. solder should be used for the band and the cusps. A portion is then sawed out of the buccal side of the crown, into which the facing is carefully



fitted. The facing is then backed with pure gold 36g., the backing being extended to the edge of the buccal surface of the porcelain throughout its entire length. This being replaced and the post adjusted, if one is desired, then a platina wire is wound about the parts to hold them together, and after being fluxed and the solder placed in position, the attachment of the backing to the pins, the strengthening of the backing, the attachment of the post and the attachment of the facing to the other portion of the crown is all done at one heating and that, too, without any investment and in the flame of the Bunsen burner. When the case is ready for soldering the twisted ends of the wire are grasped with a pair of tweezers and the crown is held within about two inches of the flame, with the porcelain always next to the heat (see cut No. 2), the whole being gradually passed into the flame (see cut No. 3).

When the solder is melted the case should be gradually removed from the heat, not more than two or three minutes being necessary to heat, solder and cool the case.

There is no secret connected with this manner of soldering crowns. All that is necessary is care in the preparation of the case for soldering, after which nothing is required except confidence. You can do this as well as I can if you only think so. I have purposely avoided in this paper a consideration of the thousand and one minor details connected with soldering, leaving them to be brought out in the discussion if desired. And have also cut the paper short because I want to occupy a little time in demonstrating the soldering of this case I have brought with me.

A METHOD OF MOUNTING GOLD CUSPS ON BROKEN-DOWN BICUSPIDS AND MOLARS.*

BY B. J. CIGRAND, B. S., D. D. S., CHICAGO, ILL.

Few dental operations which we are called upon to perform demand a keener judgment than cases where the occlusal surfaces of teeth are badly decayed, and present conditions somewhat unfavorable for a large gold filling, and at the same time suggest the possibility of a crown. To be able to discern when to apply a gold filling, or any filling for that matter, or when to resort to one of the various methods of crown work is certainly a knowledge which can only be ripened by the benign influence of both hard study and extensive experience. These classes of operations awaken us to a great responsibility, since the endurance of the dental organs entirely depends on our recognition of the proper agency which will arrest decay and simultaneously reproduce the elements which enter into the process of mastication. In the event of failure to apply the correct remedy we have in a degree violated the laws of nature, and are responsible for the malsequence. To crown or not to crown is the question; and the correct solution of the inquisition involves technicalities, circumstances and relations as perplexing as any problem which may possibly present itself to the conscientious dentist. It is far from being as simple as it appears, and its complexity is more and more revealed as we study the teeth in their relation to the human body.

*Read before the Odontographic Society.

To be able to foretell the ultimatum of either the filling or crown would be indicative of a wide scope of learning; and he who can give this prognostication is in the true sense of the title, a doctor of dental surgery.

The countless difficulties which might manifest themselves by either application would require for their correction that the operator look well to nature for advice, and in search for the latter he must have garnered his knowledge from every available source which would tend to broaden his erudition of the art as were the science of dentistry. He must call to his aid anatomy, chemistry, therapeutics, prosthesis, pathology, surgery, mechanics, sculpture, and all their correlated sciences if he hopes to be master of the situation. I repeat that these cases will call into play all the latent learning of the operator, and those who have attained any proficiency in this particular direction must of necessity have faithfully labored to acquaint themselves with the underlying sciences; and you will agree with me when I say that few indeed are sufficiently familiar with these collaterals to promise decisive results. I for one take this opportunity of confessing that my meager and limited acquirements along all these studies will not permit me to afford you extensive counsel on this most intricate query; and those who can need be well informed relative to the various liabilities—be they mechanical or pathological—to which a tooth in its functional performance is subjected, and further, they must be intimately acquainted with the minute anatomical and histological relations of every component part of the tooth and the soft tissues which surround it.

Who can predict which of these two methods—the filling or the crown—in the case cited would yield the most favored results? Both operations are liable to serious consequences, of which I will speak directly. If I were to pronounce my opinion without reservation, it would be commendatory of the filling; and yet I have every reason to believe that a properly constructed barrel or telescope crown positioned upon properly trimmed surfaces, with untiring and exacting care, might rival the perfect filling. Conservative practitioners throughout the profession are ever reluctant about substituting an artificial crown when conditions demonstrate that a filling could be anchored promissory of dental preservation. I believe the better operators are in favor of saving a badly decayed occlusal surface by means of oxyphosphate filling, and at

intervals as the material dissolves, refill with this composition, rather than to cut down unduly the tooth and subject it to a collar or barrel crown. If we are to refrain from one thing it is cutting too freely what nature intends and demands shall be retained. It would be a wise rule to follow in all departments of dentistry to preserve as much tooth structure as is possible without liability of abridging the durability and usefulness of the operation.

There is a disposition abroad to trim off, grind down and crown teeth which are sufficiently strong to warrant some process of restoration, other than the usual gold crown or miniature "tomato can." When I employ the word crown I use it in all possible latitude, as meaning that portion of a tooth which is exposed to mastication; and when we are told that a tooth is crowned we infer that its entire exposed surface has been restored by some of the systems of substitutions; thus any appliance which partially builds up or restores a natural tooth cannot in the strict sense of the term be called a crown, but must be known by a term representative of the regional part rebuilt. The practice of thus cutting away sound dental structure to permit of a capsule of gold should be condemned. It not infrequently happens that the tooth may be in such a condition as to be exceedingly difficult to save by a filling, and yet this tooth may be restored to its original usefulness by a system which embraces the salient points of both the filling and the crown. Hence if a filling will not prove serviceable, it does not necessarily follow that the next process should be that of crowning; but we can rely on a method which embodies the principles of the two former systems, and thus arrive at a middle or common ground which will allow the potent factors of both to assert themselves, and in consequence, between the ultra-conservative and the radical we have joined the two and are fairly certain in the event of failure that we have still permitted an opportunity that will allow us to resort to either of the previous methods.

What I hope to emphasize, is that the prevalent use of the telescope crowns as usually set are a menace to health, and should not be employed to individual crown work, neither in bridge dentures, unless there is no other avenue left for redress. The injurious results which come from collar or from barrel crowns is evident to any patient who jealously cares for the hygienic conditions of the mouth; and operators who are concerned about the

welfare of their patrons cannot give the matter of properly fashioning roots prior to setting these crowns too serious consideration.

It is indeed alarming the amount of unpleasantness and morbidity which accompanies these illy-set telescope and band crowns, and the dentist who is unmindful relative to appliances which encroach upon the gingival margins of the gums, or which in any manner grapple the cervical borders of the teeth, is indeed jeopardizing the health of the people he serves. And in connection with these appliances which cause these unsatisfactory events, privilege me to mention that clasp dentures, regulating appliances, partial vulcanite cases and bridges, constructed regardless of these known principles, bring about untold misery and loss to hundreds of patients. Any material or agency which obstructs the interdental spaces and hinders cleanliness is inviting pathogenic organizations which will irritate, and through their presence inaugurate inflammatory processes that will eventually cause loss of the teeth and the surrounding parts. Consequences of this character are sufficiently unwarranted to entitle the sufferer to serious charges against the operator.

Writers long since recognized the importance of the interdental spaces; but it remained for the great apostle of dental science, Dr. G. V. Black, of this State, to elucidate, and in most scholarly language, the functions of these apertures. It gave me pleasure and instruction to read and study his series of articles entitled "Management of Enamel Margins," which appeared in the *Dental Cosmos* in 1891; and I would advise those who are enthusiastically in favor of the collar or telescope crowns to read and digest this most exhaustive treatise on this subject, and become convinced of the fact that any crown which is not in direct apposition at the cervical margin of the tooth, and which endangers the continuity of the gum septum or constricts the interdental spaces is not conducive to health or comfort. And should the radical crown worker still long for further information on this vital question, his desires can be fully satisfied by perusing the address of Dr. Black recently read before the anniversary meeting of the Chicago Dental Society, in which he authoritatively asserts that proper occlusion of the teeth is secondary in importance to the preservation of the interdental spaces.

The method which I have the pleasure of describing this evening is one that will save tooth structure very considerably

and does not interfere with the normal conditions of the inter-spaces, and permits of a healthy growth of the gum septum, since it does not invade this region, and in consequence affords all possible freedom to the gingiva. The process of constructing a cope by this method may at first sight appear difficult and even intricate; but I assure you upon closer acquaintance with the process it will prove to be simple indeed, and will appeal to those who intend to avoid the consequences of a barrel crown. By this method we avoid the great display of gold accompanying the "all gold crown," and this you will observe is indeed an important feature in modern prosthetics. Patrons of to-day prefer to retain natural dental appearances, and dislike very much to be obliged to exhibit the too brilliant gold crown. Nature in this particular cannot be improved upon, and the practitioners who attempt to add to the beauty of the patient by inserting either a colossal gold filling or a glittering gold crown are certainly blind to the laws of harmony and æsthesia. The method which will permit of a true reproduction of natural appearance and usefulness is indeed the method that will invoke admiration; and if we ever keep in mind lines from Beattie:

"O, Nature, how in every charm supreme—
Whose votaries feast on rapture ever new."

we will ever be inspired to copy and design after nature, the soul of God, and cannot go far astray from what is right and enduring. And in response to the love which we hold for nature we should be opposed to any unnecessary destruction or uncalled for alteration in shape, color or size of the normal dental organs; and any method which will approximate nature will be welcomed by the better elements of our communities.

I will consume but little of your time in delineating the several steps in the production of the dental cope. Its application is found advantageous in the case in question, and particularly so when the dentist is tempted to position an "all gold crown." It not infrequently happens that teeth decayed as is shown in Figs. *A* and *B* are presented for restoration, and the difficulty of inserting what is known as an Ottolengui gold filling would require an unusual amount of time and subject the patient to a severe task, say nothing about exacting from them a considerable remuneration; and the latter enters into the circumstances as a potential factor in many cases. To properly reconstruct cusps on a gold

filling, as in Fig. C, will completely tax the ingenuity and patience of any operator; while by the method proposed the work is materially simplified, without serious detracton from durability and usefulness. We begin by placing the rubber dam in place, cut out the decayed contents of the cavity, shape it for an occlusal surface amalgam filling; permit the filling to set, after which grind or trim off the entire occlusal surface to a point corresponding to the cusp margin, as in Fig. D. Then with the aid of the



A Method of Mounting Gold-Cusps on Broken-down Bicuspid and Molars.

Hollingsworth cusp buttons proceed to select a cusp which will in shape and size completely restore the portion of the tooth cut down; after selecting the latter with reference to natural occlusion produce in the usual manner, the swaged or solid gold complement Fig. F. If you desire a good swaged cusp fashion the pure gold cusp outline and flow into it 22k gold solder; trim off the overhanging portions of the gold and solder the cusp to a small piece of plate gold, Fig. G; this gives you a swaged cusp thoroughly

sealed at the cusp margin and will answer the same purpose as the solid gold cusp. Next use a trephine Fig. *S*, such as is employed by Drs. Walker or Younger in the operation of implantation, and cut a circular opening into the occlusal surface of the tooth Fig. *E*; fit into this opening a complementary gold ferrule a trifle wider than the depth of the circular cavity and position it; next paint the exposed portion of this intradental ferrule with either rouge or gum arabic and by fastening the occlusal surface of the gold cusp on a stick of wood by means of wax it can be readily brought to its relative position on the intradental ferrule, the rouge will mark the line of contact—or if you have used the gum arabic the ferrule will come forth with the gold cusp. Now solder the ferrule to the cusp by using a sparing amount of 18k of gold solder Figs. *H* and *I* and the entirety is after usual trimming ready to be anchored to the natural tooth by means of a cement which is free from grit and of a slow setting character. Permit the cement to completely set and then with cuttlefish disks proceed to polish the golden cusp to conform accurately to the tooth. If the tooth is considerably wasted away a band may be added to the cusp button as in Fig. *K*, and solder the piece of gold plate to the free border of the extending band, and to this you fasten the intradental ferrule, as in Fig. *L*. This system of building up the occlusal surfaces of teeth does not confine itself to bicuspid alone but to the molars as well; but on account of the similarity of the operation it will be needless to explain the latter process. Should any pulp or apical troubles arise the case can be readily treated intradentally since access to the pulp chamber can be easily had, there being no obstructing post.

In the bicuspid whose lingual or palatal surfaces are extensively decayed it can be built up as in Fig. *N*, after which place about the tooth a gold band held loosely in position by means of copper wire as in Fig. *O*, then with a long hoe-shaped instrument the obliquity of the tooth is registered; now remove the band and bring the edges in apposition and solder, trim off at the point indicated by the hoe-scratch, and solder to it a piece of gold, trim off the excess metal and reposition on the tooth to cut off the occlusal edge as for a telescope crown. Remove same and attach the gold cusp and affix the intradental ferrule and you have what is represented in Fig. *P*, and when in position as in Figs. *Q* and *R*.

This latter method can be employed in anchoring a buccal-bridge denture and avoids completely encapsuling the sound bicuspid, as is the practice generally. I have not as yet produced the cope in porcelain and there appears to be a favorable condition in some cases which might permit of the use of porcelain; such cusps if they prove sufficiently strong would restore the tooth admirably. It would necessitate, however, that the base of the cope, be made of platinum and that considerable of the occlusal surface demanded restoration, since a thin cusp or veneer would eventuate in failure, and I quote the language of Dr. Taggart on this, which reads: "The more you engage in porcelain work the more artistic you desire to be, providing you do not sacrifice strength. To attain this end, we must use a greater bulk of porcelain, as I have learned by experience that porcelain for grinding surfaces must be in bulk."

The entire cope can be constructed out of the mouth if an impression of the case is taken subsequent to trimming down the natural tooth. Pour the impressions in metal and proceed as already directed.

It should be the endeavor of every dentist to produce the desired results with the least possible strain on himself and patient. And the true observance of this rule will prove a most powerful factor in benefiting the dentist and alleviating the suffering public. Too often operators in order to obtain certain effects, perform the operation by a method involving more nerve force than would be required by possibly a similar or more direct process. It is not always imperative to employ the method which consumes the greatest amount of time and patience; neither does such a method indicate that success is its natural and immediate sequence; far from this do we find the experience of the past to record, and permit me to refer to the days when the conscientious operators without the aid of the rubber dam, imbedded large gold fillings—the work was arduous, consuming time, patience and even life, while to-day with the assistance of the thin vulcanite our ideal is realized with ease and certainty. We all too well know that our vocation is of a character fully impregnated with trials and tribulations which not only try our nerves but our souls as well, and if, in our intercommunications, we arrive at conclusions which will assist in simplifying, without nullifying the work in hand, and at the same time afford a diminution of suffering to our patrons, I

for one, believe we are performing the purpose of our calling, and responding to the bidding of nature and humanity. I have tried in my feeble way to implant in the overzealous and industrious mind the maxim that "There are many roads which lead to Rome;" many of these highways lead through uninviting territory, and obstructions greet the traveler at every turn; some of these paths wind their course through lands low and swampy, making progress slow and uncertain; while a few of these routes lead directly over portions of the country teeming with beauty and lending inspiration to the weary wanderer as he safely and readily journeys toward the desired goal. And just so with our methods of reaching success, no two are the same; all promise you the city, but few bring you quickly and comfortably home.

It is not my intention to appear before you as a pathfinder, for such a role would be presumptuous; it will however afford me great pleasure to give a few points in the hope of correcting a needless and undesirable bend in the course to success. If it be my happy fortune to in some manner make more smooth and traversable this track, possibly by dislocating some impeding rock, or removing even a trifling obstruction the apparent insignificant act, may avoid a serious wreckage to some sojourner in the days to come. The needed amendment to the course may have suggested itself to others, and if these predecessors have labored on its correction, and it has come to me to simply complete the task, it does, not follow that all praise shall be tendered me; since my feeble effort has been the least worthy of attention. Hence I have hope to be understood as not endeavoring to elicit the inference that this deviation from the old path is purely original with me, for few inventions are, since the underlying principles of nearly all which we call new have been understood and brought into practicability at some previous time in the make-up of the royal road. Hence inventions which we think entirely original are but a modification of applied principles; the invention of photography was indeed a great find, yet on the calm lakes of mother earth, the surrounding country was reflected years before man's habitation; and hence the adage "there is nothing new under the sun."

If I have interested you in a departure and awakened a desire in your practice to follow out its purpose, I feel fully satisfied that my paper has accomplished all that was intended. In a liberal profession such as our calling is, it should not be the purpose of

any individual member to attempt to attain prominence by seeking to rob from others that which will assist in bringing to him unworthily even the slightest tribute. I feel that I am undeserving of the many commendations regarding the recent clinic at the anniversary meeting of the Chicago Dental Society, and it is farthest from my mind to pose as an inventor. It is immaterial, in fact, who has wrought desirable changes, the only inquisition which concerns mankind is "What worth has the departure, does it lend comfort and assure progress?" If it has these accompaniments they are the only elements which appeal to consideration.

It is the duty of each of us to endeavor in some manner to improve the dental highway whether you labor on the surface, toil down deep in the foundation, work on its drainage, or concern yourself about its adjacent attributes, the quota thus contributed will in time *sequenciate* in a road, free from any infirmities, exempt from any molesting influence or liable to early disuse, for with its bed built on the eternal rocks of truth it will endure and serve as an inviting highway, upon which will travel, in years to come, a corps of men more gallant and an army more noble in purpose, than were the imperial knights of Cæsar's legion.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

Regular meeting January 5, 1897, the President, Dr. Louis Ottofy, in the Chair.

Dr. A. H. PECK read a paper entitled "Soldering."

DISCUSSION.

Dr. E. D. SWAIN: In 1861 when I left my patients temporarily, after a practice of five or six years in different parts of the country, every man knew how to use the blowpipe. Every man knew how to solder. Not only that, but to make his own plate and to make his own solder. I presume Dr. Cushing remembers very well the difficulties he had in learning to use the blowpipe. I do. But when it came to the idea of keeping up a continuous blast it was very sudden, and from then until now it is one of the things we cannot forget. I was out of the profession for nearly five years, and when I returned to practice such a thing as soldering was

hardly known in a dental office in the northern part of this country, nor even the southern part. There was no occasion to use the blowpipe. Consequently the condition of things which Dr. Peck saw in a dental college had only then come about as a result. The men who were educated between 1861 and the time when gold crowns and bridge work first began to be made were not taught to solder, but are now to some extent teachers and demonstrators. There was hardly anything but vulcanite except in a few offices, and the dentists who occupied those offices were considered old fogies. Metals were not used, but the introduction of gold crowns and of bridge work came about, and the working back again into metal for partial plates to a considerable extent has brought about a change, and a change for the better without question.

After listening to Dr. Peck's paper and seeing the demonstration which he has made, I feel that he has left very little for me to discuss. Of course, the members of the society might give us some points as to their particular mode of operating, but as my own method is so near like that described by Dr. Peck I have very little to say upon the subject except to remark that in order to do a good piece of soldering, after making everything clean, and even sometimes taking the trouble to scrape the surface on which you are to apply the flux, you should heat the investment and the plate and teeth first almost, if not quite, down to the flowing of the solder, and then directing the blaze upon the soldering it drops down to its place smoothly, making the use of the chisel almost unnecessary. Another thing which is accomplished by that is that the solder always flows toward the hottest point, and if the investment is heated beneath and behind the teeth themselves the solder flows into the interstices and makes good solid work. The solder flows under and between the backing in the plate and makes it strong between. If you attempt to make it solder otherwise and the flame is put to the solder too early it produces a sort of sweating process, in jewelers' parlance, the piece of solder is fused sufficiently to adhere or cohere.

I do not know that I can give you any new points in regard to soldering. Cleanliness from beginning to end is one of the things which should always be looked after. It is very poor, if not dangerous policy to attempt to solder a piece of work that has not first been boiled in pickel or in alum-water in order that the oxide which forms from the alloy in previous heatings shall be removed.

Either that should be done or the plate and backing should be scraped to give a clean surface.

Dr. A. O. HUNT: I agree with Dr. Swain that Dr. Peck has been so painstaking and careful in regard to the smallest details in this demonstration of soldering without investment that there is very little to be discussed. However, there was one thought came to me at the time when he mentioned the unequal expansion of platinum and porcelain. It is this: that if a large piece of solder is laid over all, so that if at any time during the process of rotating the flame in, under and about the investment, it cannot come in direct contact with the platinum pins, there will not be a sudden expansion of the metal in the pins, causing the porcelain to check. A plate of heavier solder prevents the too rapid transition of heat to the metal underneath, and thus equalizes more nearly the expansion of the metal and porcelain.

I was very much pleased with the demonstration of soldering with porcelain not invested. It is well known that porcelain in the process of fusing has to withstand a very much higher degree of heat than that required for the solder to flow. But very few would always be sufficiently painstaking and careful about their methods of applying the heat to the porcelain if the crown or piece was not invested. For this reason the investment is of some value; but it is not absolutely essential, as Dr. Peck has demonstrated.

I feel like saying a few words in the line of Dr. Swain's remarks. From 1861 or perhaps a year or two earlier than that—from 1859 to 1860—up to 1880 there was hardly any metal work done that required soldering by those entering the profession during that period. If gold was used as the base of the denture the soldering was not of a particular character; it consisted merely in the soldering of loops on a plate to retain rubber or celluloid. This was before bridge work was introduced into the profession to any extent. For twenty years or more the delicate manipulation of metals and porcelain combined was a lost art in dental practice. The experience gained before that time in the art of using the mouth blowpipe skillfully will never be forgotten. I prefer the bellows. There are features in the use of the latter that I regard as important. With the blowpipe in the mouth the head must be at a fixed distance from the flame nearly all the time. One hand is occupied in directing the blowpipe, while in using the bellows both hands and the head are free, so that one is enabled to see any

part of the work to better advantage. A continuous flame can be managed by the bellows with so little effort that I am one of those who believe it is a decided improvement over the mouth blowpipe. One other point is with reference to the kinds of flame to be used. A fine reducing flame of the blowpipe is rarely ever called for in joining the points of a crown or bridge. The brush or larger flame, which will cover the greater part of the piece to be soldered, is more desirable, as one is less likely to break the porcelain, the heat being more evenly distributed over a larger area.

Dr. W. H. TAGGART: I wish to commend Dr. Peck's paper, and if I am wrong in the criticism I am going to make I wish the doctor would draw my attention to it. It is this: In the crown that he soldered for us, the parts were simply united with the solder, but the places where the solder would want to be flushed in to contour it, or in additional places where we desire to bring out the full contour of the tooth, I believe he did it with the flame.

Dr. PECK: Yes, I did. I shall have occasion to do it again in my office to-morrow.

Dr. TAGGART: While Dr. Peck does that, it seems to me it is much harder to do it that way than to draw the solder to one point with the blowpipe flame. As Dr. Swain has said, the heat will go to the hottest part, and there is a tendency for all the solder, when it has become melted, to gravitate to one point, leaving parts that are already soldered properly. You have to rotate it to get it to stay at one point. It is much easier to do this with the blowpipe than with anything else.

Again, Dr. Peck spoke of putting on all pieces of solder at one time. I would ask him whether he thinks that is desirable.

Dr. PECK: Yes, I think it is in such a case as I described.

Dr. TAGGART: It seems to me the fewer pieces of the solder you put on at one time the better you fuse it, and get it to flow into all places without forming pits or pockets. It would be an advantage to put on pieces as they melt than to put on all pieces at one time. These are the only criticisms I would make.

Dr. F. N. BROWN: Crown and bridge work are my food and drink; I scarcely study anything else. I do not proceed exactly as the essayist. The first thing I do when I procure any teeth from the dental depot, is to remove every particle of wax and allow none to come in contact with my work while in process of construction. I use "Parr's wax flux" in waxing up and holding

parts together until the piece is invested. It is then placed over a Bunsen heater and the "Parr's wax flux" burns out, leaving the piece fluxed. I then sprinkle it with a little dry powdered borax and place enough solder on to cover the pins of the teeth. I then proceed to heat the investment and solder up, adding one piece of solder at a time. I never remove my piece of work to a soldering block, or anything else, but let it remain on the Bunsen heater while soldering up.

Dr. Peck says "All breakages come from backings being so positioned as to put strain on the porcelain in cooling." I think most breakages come from allowing the porcelain facings to touch and that from expansion, the facings are cracked. In soldering, I never use the mouth blowpipe; I prefer a blowpipe on a stand so that I can keep a foot-bellows or compressed air apparatus going, then having the flame constantly directed on the work. In this way, there is no cessation of heat at any time. The use of "Parr's wax flux" in bridge work cannot be overvalued.

(Here Dr. Brown demonstrated on the blackboard.)

Dr. B. J. CIGRAND: I desire to say a few words in reference to Dr. Peck's paper. It is a paper that I think will do both the older and younger members a great deal of good. He has emphasized the unimportance of investment; we have learned that the investment is for the purpose of only holding the parts in apposition and position while soldering; whereas in single small pieces, where the parts can be held in apposition by wire or otherwise, investment is not necessary. The lesson taught us this evening I learned some years ago under somewhat exciting circumstances. When I first started to practice dentistry, one of my first cases called for the application of a bridge to restore the teeth. While I had the bridge and large investment on the fire my attention was directed to the fact that I had some errand to do down town. I went down town to one of the dental depots, unintentionally left my investment and bridge on the fire at the office, and did not return for about two hours. While I was down town it occurred to me that I had left my bridge and investment on the fire, and you may be sure it did not take me very long to catch the first car. When I reached my office I believed that the bridge was spoiled, and as I am somewhat of an optimist, I tried to make the best of it. I made up my mind that the bridge was spoiled. I saw that it was red hot and thoroughly radiated, and after using

the blowpipe a little the solder flowed away as so much cream.

I was determined, in the event of a failure, to have the personal pleasure of having brought it about, executed my intent, little thinking that an underlying principle in soldering would be revealed. I threw the case in powdered plaster of Paris to cool, and, upon disinvesting the case, I found I had made one of the best solders in my life; the secret of which is : use the blowpipe very little and get the case good and hard. I hardly ever use a blowpipe except in large bridges. I use the Haskell-Bunsen burner, and I never employ a blowpipe in the production of what we call barrel or telescope crowns. I make the entire operation with a Bunsen burner.

With reference to the globulating of the solder, that has been explained by Dr. Peck. It arises from the fact that the parts are not thoroughly heated, or there is present some foreign matter. The majority of solders are composed of several base metals. They generally contain zinc and other low fusing metals. If the solder is globulated, and we still pour on the heat, the result is, the zinc or brass, whichever there may be in the solder, is burnt out. The low fusing metal is burnt out because you have poured a constant stream of fire on the globulated solder. This results in your having pure copper or silver remaining. You have in consequence a high fusing solder on the gold. You constantly keep on the annealing point and there is a hole burnt in the gold. This shows the utter disadvantage of using the blowpipe to any extent.

Another point Dr. Peck has shown us is how to prevent the solder from flowing in the directions where he does not want it to flow, and to attain this he uses ordinary stove blacking. I employ instead of this agent a paste of whiting and rouge, and find it fully answering the purpose.

When I make a barrel or telescope crown, after I have made the band and readjusted the cusps, and invert it and proceed to solder it to the band, the band may, while in the flame, become unsoldered. If the stove blacking or whiting, whichever you prefer, is used on the joint of the band you can solder the cusp full of gold, and there will be no unsoldering or opening up of the band. I have recently resorted to the method of filing all my solders as they come from the dental depots into almost a dust; in order to eliminate all of the steel, etc., from the filings, I pass through it a large magnet, this way your solders will melt a good deal quicker,

since you create a greater surface for the flame to play on. With reference to holding the crown in the flame and the likelihood of the solder jumping out of position on account of the puckering up of the borax, if we take the crown and use gum arabic, making it into a mucilage over the borax, we can force or hold the solder wherever we like and it will stick there.

I believe Dr. Peck has emphasized the true underlying principles of soldering better than I have ever heard or read of. Briefly, I would again say, get your case well heated and seldom use the blowpipe.

Dr. J. H. WOOLLEY: I was glad Dr. Cigrand brought out a point concerning borax which is not touched upon very frequently. Borax in the process of melting has a tendency to move the solder. If the borax is melted previous to its use and ground finely, it will not interfere with the solder, so that that process makes the placing of the solder just where it naturally would belong, or where it was needed.

Dr. PECK (closing the discussion): One point referred to by Dr. Hunt, that of placing large pieces of solder over the pins to prevent them from becoming unduly heated, may be of service in some cases, but if the investment is thoroughly heated from the under side first, as indicated in the paper, such precaution as the one cited above are positively unnecessary.

As regards the use of the bellows, I do not object to it. Indeed to those who are in the habit of using it I would say never give it up. I do not care to use it because I have become so thoroughly accustomed to the mouth blowpipe that I use it in all cases without the slightest difficulty or fatigue, and too, I believe I have better control of the flame than one can possibly have when using the bellows.

This crown can be as easily contoured in the Bunsen flame as if it were invested. The solder can be melted on one side to any extent desired without disturbing that on the other side in the slightest. It may be easier for some to invest and reinvest for the purpose of contouring but not for me.

It may not be out of place to state that the crown I made in clinic before the State society last spring was heated and cooled five different times for the purpose of perfecting the soldering and contouring, which also demonstrated the fact that there is no possible danger of breakage with this manner of soldering.

The "correction" cited by Dr. Taggart that in soldering large cases very small pieces of solder should be melted into the crevices, etc., after which more is added from time to time until the case is completed, I consider one of the greatest mistakes one can make in doing this work. What is the use of occupying the extra time necessary to permit the case to partially cool, to place more solder, and to reheat, and to repeat the foregoing several times until the soldering is completed, when all can be done in most cases with one heating. All that is necessary is care in the preparation of the case for soldering; the crevices must be thoroughly cleansed and fluxed and the case thoroughly heated from the underside. If this preparatory work is not thoroughly done one must not expect desirable results.

However, you will remember I stated in the paper that we have our individual methods of producing results, and we are oftentimes very prone to consider our method the best. It matters little to me what method one uses provided he uses it well and gains the desired result within a reasonable time.

I do not think the teeth or facings in contact one with the other are any more liable to break than when they are spaced—providing the case is evenly and thoroughly heated. Many times I have soldered large cases in which the teeth were in close contact one with the other, in fact, in some instances even jointed together, and I haven't gotten into trouble. I can't help believing that the predominating cause of the breakage of teeth and facings is the untimely heating of the pins.

INCIDENTS OF OFFICE PRACTICE.

Dr. EDMUND NOYES: I happened last summer to be unfortunate in three similar operations, a brief story of which may be of some little interest to you and perhaps instructive, although the cases are common and ordinary enough. Two of them were central incisor teeth, for a lady, platinum gold restorations. These central incisors had been tipped with gold the sixteenth of an inch, I do not know how long ago, but probably fifteen years or more, by Dr. E. R. E. Carpenter, and the gold tips were still there doing good service; but the lower incisors were cutting so deeply into the teeth upon their lingual faces as to make it desirable to cut out these surfaces and cover them with gold. The lower incisors were not only striking and wearing deeply into the back part of the central incisors above, but the whole faces of the lower incisors

lay close to the lingual faces of the upper ones down to their points, so that restorations had to be very thin. The lower teeth were very short, so that it was absolutely out of the question to shorten or cut them any. She was wearing bridges in the lower jaw on each side so as to retard as much as possible the wear and strain upon the front teeth. It was necessary to remove the old operations, cover the lingual surfaces with the platinized gold and expose about a sixteenth of an inch of the metal to view upon the points of the labial aspect. It was done in this case with rolled gold, No. 60, which I have not used very much, and doubtless part of my difficulty came from the infrequent use of heavy foils in my practice. The operations were made on two very hot days in the summer, and once or twice during the progress of the work the pieces of gold did not stick as promptly and readily as they usually do, and it occurred to me that there was danger that my welding might not be perfect at some point. They did settle down however, under the force of the mallet and appeared to be secure. Probably I did not grind the back part of these teeth so much as I ought to have done in finishing, and left the lower ones striking them a little too hard. At any rate, during the next month they peeled off, little layers at a time, one of them worse than the other, until within a month or six weeks I was obliged to make the operations over again. It bothered me a little at first to determine the cause of the trouble. As near as I could decide in my own mind there were two causes. First, a slight defect in the quality of my alcohol flame with which the gold was annealed. I noticed at the time it was a little red, and I could not fix my lamp so that it would not be. Heretofore I have noticed more difficulty in getting a perfect alcohol flame in the hottest days of summer than at any other time, probably because the air is fuller of moisture which the alcohol absorbs, so that it is reduced in its proof.

Dr. HARLAN : There is more sodium in the atmosphere when it is so hot.

Dr. NOYES : Probably that may account in part for the yellow flame. The second cause was that the malleting of the heavy gold was not thorough enough. When I got through with the operations, the second time, the fillings appeared to be as solid and homogeneous as pieces of steel and gave promise to stay there as long as I want them to stay.

The other case was similar in the fact that it got knocked off,

but the cause was different. It was the case of a young boy who had smashed a large corner of an incisor tooth some years ago. I postponed the operation because he was so young and the tooth had so recently been developed, if it was indeed fully rooted at the time. I tried to preserve the pulp, but it died, and I filled the root but postponed the restoration of the crown. In the meantime, which I ought to have foreseen and did not, one of the lower incisors projected its corner forward so as to interfere with the restoration I wanted to make. If the case had been a girl I should have cut off a portion of it and made a porcelain restoration with some sort of partial crown, but being a boy I believed that the best, strongest and most durable thing I could make would be a platinized gold corner. I brought back the lower incisor so as to be out of my way, built down the corner carefully, but I did not hold the lower tooth in its place long enough and left it with the belief that my operation was strong enough to hold it back. It proved not to be so, and at the end of a month he came back with the end of it knocked off by the constant hammering against it of the lower incisor which gradually returned to its old position. In this case I succeeded by cutting down only a portion of the filling that had been made and building it down without sacrificing the whole operation, and I hope it will remain there. It has been some months since this was done and it gives promise to stay.

The lessons of these operations are obvious and simple enough, and if I can keep somebody from losing such an operation I shall be glad of it. I have made many restorations of corners and ends of teeth with platinized gold and many with pure gold and have very seldom seen evidence of imperfect welding or defective anchorage. These cases I have mentioned annoyed me a good deal.

Dr. J. G. REID: There is one point I would like to refer to. In annealing platinum and gold the doctor may have overheated it and destroyed the cohesive properties of the gold which we know is very essential to the proper building of a platinum and gold filling. This is true in using No. 4 foil, for instance, if you are not careful in heating you will burn the gold off, leave the platinum surface alone which will destroy the thing that Dr. Noyes speaks of.

Dr. NOYES: I intended in my remarks to speak of the necessity for careful and delicate annealing of platinized gold. In these

cases every piece was watched as carefully as possible, either by my assistant or myself.

Dr. REID: Did you do the annealing yourself in these cases, or did your assistant?

Dr. NOYES: Usually my assistant does it. It is possible that an error might have happened in that way. It is my belief and experience that platinized gold requires considerably more delicacy and accuracy in its annealing and considerably more minute care in malleting than pure gold in order to get an equally perfect and solid welding. Heavy foil must be very thoroughly and minutely malleted with considerable force. In these cases I used No. 60 foil folded once.

Dr. WM. T. REEVES: I had a case come into my hands recently that may be of interest to you. I will briefly report it. A gentleman, forty years of age, who has large and very good teeth, having but one or two fillings in his mouth, about eight years ago had a left lower first molar cavity filled which was extremely sensitive at the time, so much so as to be filled with cement. When the filling needed renewal he came under my charge, the cavity was prepared and again filled with cement without being sensitive. On renewing the filling about two years ago I prepared the cavity for and filled with gold without any discomfort resulting whatever. About six weeks ago he had a very severe toothache, which lasted a short time and passed away. In looking at his mouth about a month later he noticed that the corner of his tooth had become very pink and wondered at it and came to show it to me. As he was not having any discomfort at the time I advised him to await further developments. Last week while at lunch he broke the enamel in on that corner, and on coming to the office I found that the entire corner was absorbed, that is, the disto-buccal corner. The cavity resulting was filled with an hypertrophous growth of pulp tissue. I started to remove as much as possible and found that the pulp became extremely sensitive. Since then I have made two applications of arsenic, the second one to-day. It is a case where the entire corner has become absorbed, and nothing but enamel left up to the filling.

Dr. A. W. HARLAN: I desire to call the attention of the society to the uses of eucaine hydrochlorate in the place of cocaine. For several months I have been using it in from 2 to 10 per cent aqueous solutions for various purposes. It can be used as a local

anæsthetic for preparing roots for crowns, in pyorrhœa pockets or for removing deposits on teeth. I think you will all like it. It is freely soluble in water and is not more than one-tenth as poisonous as hydrochlorate cocaine, so that you can use it with comparative safety. It is not expensive, being about \$4.50 an ounce. One-eighth of an ounce would be enough to last three months or longer, and if you want to use it for the purpose of extracting teeth you simply dissolve it in liquid vaseline with heat, 2 or 3 or 4 per cent solution; you will have a safe local anæsthetic, one that is not toxic.

Dr. J. W. WASSALL: I have a rather interesting case to report. A woman thirty-five years of age came to me complaining of stiffness of the jaw and of pain when trying to open her mouth. She felt the pain most in the morning. She was somewhat alarmed and the condition seemed to be getting worse. The only thing I thought might produce the pain was a lower molar, the distal surface of which contained a large cement filling. This tooth was very sensitive when filled a year previously, so much so that a temporary filling was put in. I managed to get her mouth open and took out the cement filling and discovered a cavity deeper down and beyond the filling. This subcavity, so to speak, was sensitive, but there were no signs of the pulp being exposed. I could find no other symptoms of congested pulp, except those reflex ones in the articulation. I simply disinfected the cavity thoroughly after removing the caries and made a gutta-percha stopping. A week afterward the trouble was entirely gone. This case struck me as being very singular, the pathology of which I do not understand. I do not understand why an irritation of the periphery of the inferior dental nerve should make trouble in the articulation.

Dr. W. H. TAGGART: When Dr. Harlan spoke of eucaine hydrochlorate it drew my attention to a little incident that happened in my office to-day. I was not going to relate it, but think possibly it would be better for me to do so. As is my usual practice in preparing all roots for placing crowns, I make a local application of cocaine to the gum. When the patient sits in the chair that is the first thing that is done. I bathe the gum around the tooth with a 10 per cent solution of cocaine, and then at intervals of from five, to eight minutes, this is done again. This morning I had applied cocaine three times and had hardly started to trim the root when

the lady said that the cocaine made her feel sick. I thought if I went a little deeper into the tissue that possibly the sickness would pass away by causing a little more pain. I kept on working and noticed that she did not move at all. Her face became white and pallid, and there was a cold perspiration on her forehead. I gave her a few vigorous shakes, woke her up, and she said, "Doctor, what made you wake me up? It would have been nice for you to have gone on with your work." Her hands were as cold as ice. I was scared for the time being. The treatment I gave her was only one pearl of nitrite of amyl and a drink of brandy, and one for myself. The nitrate of amyl revived her in a very short time, and the drink of brandy began to bring back her circulation. This condition of things lasted for about twenty minutes. As I made the application of cocaine, I cautioned her not to swallow any of the solution, so what she got was absorbed through the gum.

Dr. J. H. WOOLLEY: I think Dr. Wassall did not make his case complete and full. He spoke of removing a large cement filling. I would like to ask him as to the condition of the tooth before he removed the cement filling, whether he applied tests to determine whether there was pulpitis or congestion.

Dr. WASSALL: There was a little sensitiveness of the cavity. There was no congestion, nor signs of pain, except those suspected in the articulation. I have no doubt the pain in the jaw was due to the irritation and fermentation of food and the process of caries going on in the cavity underneath the cement filling.

Dr. WOOLLEY: Did you apply the heat or cold test?

Dr. WASSALL: When I saw that the tooth was in a comparatively normal condition I did not think it necessary to apply heat and cold.

Dr. WOOLLEY: It seems to me, to get at the case clearly, it would have been better to have applied heat and cold, so as to get a more correct idea of the real condition of the pulp. I have noticed in the treatment of teeth where there was pulpitis or congestion, and particularly in cases of pulpitis, the reflex pain in the lower jaw occurs in the angles of the mouth; and possibly Dr. Wassall's case may have been an exaggerated case of pulpitis, and that if he had applied the heat and cold test he would have discovered some diseased condition of the pulp which is not discoverable by the eye.

Dr. WASSALL: I was quite satisfied that it was an irrita-

tion of the pulp that caused the trouble in the jaw. What I marveled at was the fact that irritation of the dental pulp should produce such a strange malady of the articulation. This was the point I wished to bring out. I never knew an inflammation of the pulp to produce such a marked closure of the jaw. It almost amounted to an ankylosis.

Dr. D. M. CATTELL: I am afraid Dr. Wassall's patient had simply a touch of rheumatism. I have known a number of cases like it. I have had it myself a number of times, and I do not think the tooth had anything to do with it.

Dr. T. W. BROPHY: I desire to offer a suggestion. It is this, that the use of aromatic spirits of ammonia as a heart stimulant in cases of fainting or collapse occurring from any cause, as from an anæsthetic, will revive patients by reason of its rapid absorption, and produce greater activity of circulation than anything with which I am acquainted. You may use fifteen drops of it in a little water.

CHICAGO DENTAL SOCIETY.

Proceedings of the Thirty-third anniversary meeting, held at Northwestern University Dental School and the Chicago College of Dental Surgery, Monday, February 1, and Tuesday, February 2, 1897.

The President, Dr. Louis Ottofy, in the Chair. Monday afternoon, February 1, 1897.

Dr. G. V. Black, of Jacksonville, Ill., delivered an address entitled "Recent Improvements in Filling Teeth."

DISCUSSION.

Dr. C. N. JOHNSON: The announcement of the president was the first intimation I had of having consented to open this discussion. However, Dr. Black kindly read me his paper yesterday and the thing that impressed me then, as it impresses me now, is the breadth of the subject. He has touched upon various topics and they are so great that it is impossible to properly discuss a paper of this kind in one afternoon, let alone in a few minutes.

In the early part of the paper the essayist raised the point that instead of directing our efforts to contouring a tooth in its relation especially to the occlusal surface, we should give form to the interproximate space. He made one remark in the paper that I can

scarcely understand. While I think I can see the true significance and the meaning he intended to convey, I am not quite clear as to the exact expression of that meaning. He said, if I remember correctly, that we might contour a tooth perfectly, and yet not properly contour the interproximate space. It seems to me, that the one must go necessarily with the other. However, I think the point Dr. Black wished to make was this, and it is a good one. It is one that has been overlooked by many of our most brilliant operators, by men who have had the manipulation of gold down to the greatest perfection. The point is this: They have directed their efforts to restoring the form of the tooth itself with relation to maintaining the proper arch, or of maintaining the masticating area rather than the proper form of the interproximate space. In the light of our present knowledge this latter seems imperatively necessary if the gum tissue is to be retained healthy. The first time this matter was prominently called to our attention was, if I remember rightly, in a paper by Dr. Perry, of New York, in which he spoke of the necessity of contouring teeth, building them out into a contact point. He may not have used the term contact point (A VOICE: He used the word knuckling of the teeth together). He did this to the end that the teeth should be held in their proper relation, so that the gum tissue between them might be preserved.

Dr. Black followed this up in a paper read before the Chicago Odontographic Society, and emphasized the importance of maintaining the gum tissue in the interproximate space in a healthy condition. These papers did great good, but we must not lose sight of another fact in connection with this subject. In operating on teeth we should aim to accomplish the greatest good for the patient, and not have in mind one thing only. Some operators in the attempt to contour teeth so as to knuckle them, have been in the habit of reproducing the entire area and form of the occlusal surface. For instance, some have gone so far as to reproduce the marginal ridge. When we began to study the force of mastication upon these teeth, this was found to be an extreme measure; it was found to be a dangerous thing. In many instances the reproduction of this marginal ridge could not be brought about safely in gold or amalgam because of the leverage that was brought to bear upon the tooth in the force of mastication, and when any hard substance was caught between the teeth it had

a tendency to move the filling in its seat. I do not believe the reproduction of the marginal ridge is often necessary in the insertion of a perfect filling, and I believe that if we can get a small contact point which will prevent the lodgment of fibers of food between the teeth, and one which is exceedingly dense so as to avoid the formation of a facet in the filling by friction against the other tooth that we may safely, in some instances, make this contact at a point slightly rootwise of where nature placed it. Then we may slope the filling away from this point somewhat sharply and we will have not only the gum tissue protected, but the filling safe from too great leverage. In thus slightly changing the form of the interproximate space, we must avoid narrowing it too much at the alveolar border. A sufficient width must be maintained to avoid choking the gum tissue out of the space.

For the purpose of securing a dense contact point, in a gold filling on the distal surface of a molar or bicuspid, I know of no means so efficient as the use of the matrix. It forms a supporting wall against which the gold may be condensed with greater facility and precision than by any other method. The angle at which the plugger must be held on entering the mouth, is such that the blow of the mallet tends to force the gold in an undesirable direction, and especially as the contact point is reached, it tends to roll the pellets of gold toward the mesial surface of the tooth next in line, and prevents that precision of condensation so important at this point of the filling. It is my practice, when the filling is built to the point where the matrix knuckles to the other tooth, to mallet the gold against the matrix with as great a degree of force and continuance as seems judicious. This is done on the theory that gold can be materially hardened by repeated blows of the mallet even after it has been condensed.

In regard to the broad contact points that we sometimes find between teeth of patients advanced in life, Dr. Black says he is in the habit of operating on these teeth even if otherwise sound for the purpose of contouring the interproximate space and making the gum healthy at that point and avoiding future disaster in the way of decay and breaking down of the tooth. I have not gone that far. I have never operated on a sound tooth for that purpose. I have, however, done this: Supposing we have a tooth with a broad contact point and a tooth decayed next to it I wedge further than ordinarily, and before putting in my filling I round off the

sharp corners of the sound tooth and then contour the filling in the other tooth to a greater extent than when it was first formed by nature.' I thus get the original width of the interproximate space and protect the gum between these teeth. It is, of course, not a perfect V-shape when you are through with it, neither are many of the normal interproximate spaces. The first permanent molar has a greater angle on its mesial surface than the second bicuspid has upon its distal surface, so that we do not have a perfect V-shape there, but that does not prevent the gum from being healthy.

Dr. Black suggests that I pass some teeth around having broad contact points. While some of these have badly worn facets on their proximate surfaces yet I have seen many cases with much broader contact points than any here.

The question is asked me what wedge I use in the last class of cases. I do not always use the same material for wedging. I will say, however, that I am growing less and less in favor of rubber wedges for separating teeth. I would rather use some slower method with less danger of injuring the gum in the interproximate space. There is too great a tendency for rubber to follow the sloping surfaces of the teeth and insinuate itself into the interproximate space, forcing the gum tissue out and injuring it seriously. If rubber is used the gum should be protected by building a bridge of gutta-percha or cement extending from the gingival portion of the cavity across the interproximate space against the next tooth.

In cavities with broad seats and large orifices I sometimes separate with gutta-percha, leaving it in for weeks if necessary. Whenever I use gutta-percha for this purpose or whenever I employ gutta-percha for any purpose, between the teeth previous to operating, I invariably let it extend well over the festoons of the gum to keep them pressed back on a level with the gum between the teeth. This is done for two reasons—it keeps the festoons back out of the way during the operation so that they are not lacerated, and it prevents the formation of an inverted arch to the gum tissue between the teeth which would encourage the collection and retention of food after the operation. When the gum is treated in this way and not lacerated it will promptly refill the space in a healthy condition.

There is one feature of the paper I cannot pass without comment, and it relates to the demonstration made by Dr. Williams, of the penetrating action of the acid formed by the microörgan-

isms of decay before there has been any breaking down of the enamel tissue. It is a condition that might be readily overlooked by the dentist. He might pass his exploring instrument over the tooth and not find any penetration, and dismiss the patient with the idea that the teeth were in perfect condition. And yet, according to this diagram, we see not only the enamel affected, but the dentine itself, nearly to the horn of the pulp. The question is sometimes raised as to whether an operator is justified in cutting into dentine that is hard or sound in preparing a cavity, whether he must in the preparation of the cavity deepen it beyond the point of actual decay or not. I think this illustration should teach us to be very thorough in our cutting, and as Dr. Black said to me to-day, "I have been something of an extensive cutter into tissue that seemed to be sound myself, but," he says, "I think I shall be a greater extremist along that line after seeing this diagram."

Now, we understand how it is we very often have death of the pulp without any exposure of it. The effect of the attacking process, the infiltration, or whatever it may be, that softens the tooth tissue, may proceed to a great extent in advance of the breaking down of the tissue, and we have infection of the pulp which results in its death long before it is exposed. The demonstration of Dr. Williams encourages us to do more thorough work in the extension of these cavities into seemingly sound tissue, so that we may be assured of a safe basis.

I wish to touch on one other point, because it is one about which I have written some in the past. Dr. Black brought out the idea that the process of decay is not constant even in the same individual. We may have teeth decaying rapidly for some length of time, yet all at once, without any perceptible reason, the process of decay stops. It may recur again, and cease again, and so on. That does not argue, as has been supposed, that these teeth are changing in their structure, becoming softer at one time and harder at another. It is due to a change of environment, and the teeth are subjected to severer influences at one time than they are at another. We all have patients whose teeth at times seem to melt away from us despite our best efforts. Dr. Black says, however, that in all of his experience in practice he can recall perhaps not a dozen cases in which the decay was constant. The encouraging point about it is that if we are faithful in our work of treating the

disease to the best of our ability, the change is likely to occur when we least expect it, and the patient is rendered immune from caries and the teeth are saved. Young patients sometimes come to us discouraged, saying that their teeth are decaying rapidly. They tell us that some dentist has informed them that their teeth are too soft to be saved. I regret that this impression is abroad in the profession, and I hope the investigations that have been made in regard to the physical characters of the teeth and the emphasis given them by Dr. Black, together with the demonstrations of Dr. Williams, will impress upon the profession that decay of the teeth relates to their environment rather than to the intrinsic structure of the tooth itself. If that one lesson can be taught, and if the profession will heed it, many sets of teeth may be saved by working along those lines that heretofore have been consigned to the forceps.

Dr. B. J. CIGRAND: While waiting possibly for some prominent man in the profession to take part in this discussion, I would like to say that some years ago, I think it was in 1891, Dr. Black wrote an extensive article on "Management of Enamel Margins," in which the interdental space and the gingival margin received considerable attention, all of which was published in the *Dental Cosmos*, and as we have heard a good deal about operative dentistry I wish to say a few words along the line of prosthetic dentistry. It has been my sad experience to wear a gold crown for about ten years, and on account of it not having been properly made, it gives me more trouble than the rest of my natural teeth. In putting on the gold crown and setting it on the root the principles which Dr. Black has demonstrated were not observed. In fact, the crown is very much like a miniature tomato can; its lines are parallel like that (illustrating); instead of observing more the idea of Dr. Black of making it possibly more bell shaped, and thus allowing the gingival margin and the interdental space to be preserved, I simply have a crown whose mesial and distal surfaces are parallel and the teeth come in contact with it in the same manner, so that food lodges in between. I have gone to good operators in Chicago and asked them what to do without receiving satisfaction. I believe now the best thing for me to do is to have that crown taken off and a substitute made which observes the facts as explained and most carefully outlined in the paper just read, thus making the crown more bell shaped and allowing a contact point,

so that the interdental space is preserved. I will ask Dr. Black if he does not think that would be the right thing to do?

Dr. BLACK: It will.

Dr. CIGRAND: I have interviewed some of our better operators and had this crown examined and they said the marginal ridge or edge is correct; that the interdental space is all right, yet there is always more or less foetid breath and a sweetish taste that come from it.

One thing Dr. Black has done for both operative and prosthetic dentistry is, he has pointed out that we must be more careful of our band crowns, not excluding the Richmond crown, but be very careful with any band crown, to see that the interdental space is preserved, that the root is properly trimmed and that there is no encroachment on the cementum along the borders of the tooth; in other words, I believe in prosthetic dentistry we have come to a standstill and are just beginning to learn how we shall reproduce a tooth and preserve the interdental space. At this morning's clinic which I gave in the infirmary I placed upon a very badly decayed bicuspid a golden cusp, and in so doing I tried to observe the truths given by Dr. Black in his article in the *Dental Cosmos*, by making the occlusal surface of the gold cusp considerably larger than the tooth would allow, and the result is the interdental space is quite large and the lady will not have the same difficulty I have had with my crown. I take this opportunity of personally thanking the essayist for the many excellent points I have learned from his valuable contributions to dental science.

Dr. H. A. SMITH, of Cincinnati, O.: I feel especially gratified in being here to-day and to have heard the excellent paper presented by Dr. Black, as well as the remarks by Dr. Johnson. Prof. Black has done more for the dental profession in the last few years in the way of scientific work than all of us put together. (Applause.) I would like to suggest that as a body of dentists we relieve him of the tedium of dental practice and put him to make investigations for us as long as he is able to do so. I would be pleased to subscribe my mite to a fund of that kind.

There is one point suggested by the papers that I would like to call attention to, and that is the varying degrees of rapidity in the progress of caries in the different varieties of teeth. Dr. Black will remember that we were taught by Prof. Watt a long time ago that the density of teeth modified the activity of caries. In illus-

tration he said chalk dissolved more readily than marble. Dr. Black admits there is a variation of density in dentine, though slight. Is not a tooth not quite so dense more readily attacked by the acid of caries than one which has greater density? This question being intelligently settled we shall be able to give a better prognosis in certain cases as to how soon teeth should be filled, or as to the probability of their being lost by caries when attacked. Prof. Black by his recent investigations has modified our views in reference to hard and soft teeth, and I predict before long our methods of practice, based as they now are largely upon clinical observation, will be greatly changed. I have never attended a meeting in which I have learned so much in so short a time. The demonstrations we have had showing the close relationship which the environment of the teeth has to the production of incipient caries, has been to me very interesting and profitable. Prof. Miller has made clear and understandable the etiology and mechanism, so to speak, of caries in the dentine, but as to the causes and nature of the dissolution of enamel in the initial stages of caries he is not quite so clear. We have in evidence to-day new light upon this phase of the subject. If it can be proven that microorganisms have their habitat so persistently as stated upon the smoothest enamel surfaces, it will no doubt open our eyes largely and impress us that we have not been doing our duty to our patients, especially in the direction of prophylaxis against dental caries.

Dr. S. H. GUILFORD, of Philadelphia: I was very greatly interested in what Dr. Black told us this afternoon. I have always read his papers and watched his work with a great deal of interest. I consider him one of the few truly scientific dental investigators in this country. When I say that, I pay him as high a compliment as I am capable of paying any one. But while I have great regard for his scientific ability and his investigations, when it comes to the practical treatment of cases I sometimes differ with him very materially, and that is what I shall have to do to-day. Some of the points taken up by Dr. Johnson I had in mind to speak of myself if I happened to be called upon. He almost took the words out of my mouth. I understood Dr. Black in his description to say that in an approximo-occlusal or mesial-occlusal cavity he wanted the cervical wall flat; that he meant the line of that wall to be at right angles with the long axis of the tooth. I do not think

he meant that he wanted the wall to be horizontal in any sense, instead of being rounded. You do not want the cervical wall to be horizontal.

Dr. BLACK: I said I want the cervical wall or seat of the filling to be at right angles to the line of stress, whatever that may be.

Dr. GUILFORD: The stress is from above backward. In the shaping of these cavities our practice should have taught us that whatever shape the cavity happens to be at the cervical margin when it was prepared, it does not matter whether the line above happens to be the arc of a smaller circle or the arc of a larger circle. The larger the circle the more nearly it would approach flatness. Of course, when the cavity was prepared, decay removed, I have made it a point never to cut away more of the dentine than is necessary if it happened to be a regular rounded outline. I would not cut it so as to give it angular form at the side. When I was giving a demonstration upstairs some gentleman asked me why I did not cut the cervical wall horizontally, because he said when the other walls come down, the buccal and lingual wall, it would form a sort of angle there. I asked him what for? He said that was a good place to start the filling. That was not a good reason for cutting away soft tooth structure. He said that if pressure was brought to bear where the occlusal surface joins the lingual at that point the tooth would have a tendency to rock. I believe that what Dr. Black means is to have a direct line with the line of stress, having the resistance in the direction of the force in mastication. We get that sufficiently well with a rounded cervical margin just as when the wall is nearly flat.

Another point I like very much, and that is of having the cervical wall from without inward on a line at right angles to the long axis of the tooth. When the wall is tipped in, as it sometimes is slightly, it could not do any harm to give the filling a better retentive form. If it were grooved or tipped in, starting cuts in there of considerable size would materially weaken the wall. If we can avoid weakening that wall and avoid weakening the buccal and lingual walls by those cuts we gain much. Our fillings would not help us without having strength in the walls of the cavity. If we weaken the walls of the cavity, then the filling may fail from that cause and no other. For that reason, I would further agree with Dr. Johnson, although in that respect I cannot disagree with Dr. Black, that the proper way to fill a cavity of that

kind, particularly when it is a disto-occlusal cavity, is to use a matrix. Dr. Black is not a friend of the matrix, I believe. That is simply his misfortune. If Dr. Black had used the matrix as long as some of us have, and with as much satisfaction, he would be altogether in love with it. The right way to make a sound filling clear out to the point of origin of the contact point is to have a matrix or something to pack your gold against.

There is one other point I wish to call Dr. Black's attention to, and it is one I tried to make in my demonstration in connection with the use of the matrix, that is, starting the filling outside of the cavity; in other words, placing the first mat of gold between the matrix and the cervical wall, pressing it between the two and bending it over the cervical wall, using two or three pieces, then malleting those down. When this is done, you have securely held the starting point of your filling, and you are certain that the cervical wall is absolutely covered with gold. There is an excess there which you afterward remove at the time of the finishing. That part of the cavity, which has been denominated the vulnerable point, is no longer any more vulnerable than any other part, so far as the perfection of the operation is concerned.

In regard to the slides of Dr. Williams, as illustrated by the diagrams before us, I had the pleasure of seeing those slides, and if I understood them correctly, while there was no apparent breach in the outer surface of the enamel, the slides did show that the enamel had been affected, and beyond the enamel there was an area of affected dentine. If I understood the slides correctly, the darkened area represented, not that the dentine had been decalcified, but that the irritation had passed into the pulp and the pulp had thrown out a deposit in that part and made it more dense all over; that the area represented denser dentine than any other portion just as secondary dentine is more dense than the original dentine. If this is so, I cannot see the necessity of cutting it out. In preparing a cavity I believe in cutting out all dentine that we really think is affected, but beyond that I do not see why we cannot use some medicament which will remedy the condition if it is not too bad. If there was acid present we could neutralize it. If there was infection by microorganisms we could use some medicament to remedy the condition and I do not see why we should not do that. I am opposed to cutting away any more dentine than is absolutely necessary. If I interpreted

the slides of Dr. Williams correctly, the darkened area did not need to be cut away.

I would remark, in closing, that Dr. Cigrand spoke of his gold crown that he has in his mouth and of failing to get proper advice from the dentists of Chicago in regard to it. Now, if the doctor has really consulted the best dentists in this city in regard to his difficulty, I would advise him to try some other city.

Dr. JOHNSON: I am always jealous of the reputation of Chicago, and I wish to announce that Dr. Cigrand has not consulted the best dentists in Chicago.

Dr. THOS. E. WEEKS, of Minneapolis, Minn.: It is unnecessary to add a single word of eulogium to those that have already been tendered to our respected and beloved friend, Dr. Black. I have only a word or two that I would offer, and it is in emphasis of the restoration and preservation of healthy gum tissue in the interproximal space. That is a point we cannot emphasize too thoroughly in our teaching. The point has already been made and has been taught us that in order to have healthy gum tissue we must have enough room and have bone tissue upon which it will rest and grow. Our space should not only be given proper shape, but there should be a proper width of the interproximal space.

Dr. HENRY W. MORGAN, of Nashville, Tenn.: I do not know that there is anything I can add to what has already been said, nor can I add anything to the glory that we all try to confer on our distinguished friend, Prof. Black. There is nothing in the paper that I feel I am capable of shedding any light upon. The work of Dr. Black, together with his articles on the enamel margins, published a few years ago, have all been papers that have interested me very much. There is one remark that was made by Dr. Johnson in the discussion that I might say something about. It was with reference to wedging the teeth, and in emphasis of what has already been said for the protection of the gum in the interproximal space, I would say that I believe much of the injury inflicted there is due not only to the method of making the separation, but also to the indiscriminate use of the sandpaper disk. You will recall the fact that Dr. Black, in his articles on the treatment of the enamel margins, emphasized that point. In wedging teeth apart, it has been the almost universal practice for the last ten years to rely upon rubber. The improper use of rubber should be condemned, and I condemn it with Dr. Johnson. No one familiar with its ac-

tion or its use as a means for retaining space, would for a moment think of leaving rubber between the teeth longer than from six to ten hours, and it is an inhuman and barbarous practice to leave rubber to remain between the teeth for weeks at a time. Six hours in 90 per cent of the cases that come to us is sufficiently long.

A word or two now with reference to retaining this space in position until the operation is made. Anywhere from six days to two weeks later the teeth should be retained in place to permit all inflammatory action to subside. In getting the cavity slightly excavated or open sufficient to retain gutta-percha, the gutta-percha should not extend but slightly over the margin of the cavity, and in working down and crowding the gum away, in adjusting the rubber for the purpose of making the separation, it should not be carried far beyond the point of contact of the tooth if it would crowd the gums away and injure them. The long wearing of rubber excites inflammatory action and brings about the trouble that Dr. Black is trying to avoid. Packing the gutta-percha slightly over the margin of the cavity is all that is necessary to hold it back, and when the rubber dam is adjusted, the gum is carried back and the rest of the operation is made as usual.

Dr. B. HOLLY SMITH, of Baltimore: I shall simply say a word or two along the line of the remarks made by Prof. Guilford in reference to heroic treatment and to cut deeper into the dentine. It is said that a celebrated surgeon that lived in our town, by the name of Nathan R. Smith, advocated on all occasions a bold and free incision, and on one occasion it is said he had a little carbuncle on the shoulder which required an operation. He called in his son, and the son said, "Well, father, shall it be a bold and free incision?" He replied, "No, my son, cut just as little as you can." I feel that way with reference to the heroic cutting of dentine. If any one were to operate on my teeth I should want them to cut just as little as possible. The fact is we do not have trouble from any bottled up microbes in the teeth, it is the fellows on the outside that give us trouble. The proper treatment of these cases should involve the removal of all the dentine that we see slightly decayed. Dr. Morgan has condemned the use of rubber for the purpose of separating teeth. I do not think rubber should be used to separate teeth, and there is no need of using it and having the patient come back at the end of six hours to

change the rubber when other things can be used, and much more satisfactorily. Cotton with silk ligature can be kept in position. I differ with Dr. Johnson about using gutta-percha between teeth for separation and allowing it to remain for a long time because of the very thing he said, namely, to avoid pressing away of the gum and the destruction of the contour of the gum in the interproximate space.

Dr. McKELLOPS: I did not hear the whole of Dr. Black's paper, and so I am not in a position to say much about it. My friend, Dr. Morgan, has condemned the use of rubber for separating teeth, and I wish to say that there need be no fear in using rubber, provided it is placed between the teeth in a proper manner. It is not necessary to wait a week or two weeks to accomplish a separation of that kind. It all depends upon the manner in which you apply it to separate the teeth. I have been using rubber all my professional life for the purpose of separating teeth, and I have yet to see a case in which I regret having used it. The same holds true with regard to the application of ligatures for separating teeth. I have had no trouble with them. It is the manner in which these things are applied and the attention that is given to them.

Dr. GORDON WHITE, of Nashville: I assure you it is quite embarrassing for one who is not in the habit of talking to students to say anything, and I do not know that I can add anything of interest to what has been said. I should like to say this, however, that during all my professional career I have tried to preserve as much of the natural organs that were in a healthy condition as possible. I have always thought that the Creator could beat me in making teeth, so I have only removed the diseased portion of the tooth substance, and have not cut away very much of the dentine of late, as Dr. Black has advocated. I enjoyed his paper and the remarks that have been made on it, by which I am encouraged to extend my cutting beyond what I have done heretofore.

There is no man perhaps to whom the profession is so greatly indebted as to Dr. Black, and I for one read everything he writes with the greatest interest and profit, but I have never adopted the extensive cutting that he has advocated. Some time ago I was obliged to have a slight operation performed on myself, and I had a general surgeon, a friend of mine, do it for me. He was a gentleman for whom I had done some dental work, and he said,

"Now, old fellow, I will get even with you." He did not thrust his knife in more than an inch or half an inch, and I thought it was about a foot deep. I am a great advocate of not quite so much cutting as has been advocated by the gentlemen who have preceded me.

Dr. J. Y. CRAWFORD, of Nashville: I want to speak in reference to the maintenance of the interdental space, or the interproximate space, as it is now termed. Nearly twenty years ago in formulating a program for our Tennessee Dental Society, I placed upon the program the query as to whether not the sixth-year molar tooth should be preserved, and one of the best men in our State who was to open the discussion in response to that query has long gone to his home, leaving many monuments in his community to his memory. He was a good dentist, an honest workman, and very skillful; but he said he did not see why the question should be asked; that he had been extracting six-year molars for patients susceptible to the influence of carious action, and begged to be excused from making any further remark. The members of the society then urged me to make some remarks upon the subject, and the first thing I said in response to that query was that the preservation of so-called six-year molars was a precedent and a necessary consideration in order to properly maintain the interdental space. (Applause). I have been impressed and instructed this afternoon as I never have before in a dental society, and I must think that if the departed spirits watch over and take an interest in the affairs of men, that the immortal Webb must be looking upon this assemblage to-night, for it was he, if I recollect rightly, who advanced the idea that in the treatment and filling of human teeth, or rather in the treatment of dental caries, the cardinal feature was to maintain the tooth in its original shape. Without that you cannot hope to preserve the interdental space.

I want to offer a slight criticism, as it struck me as being a little strange that a gentleman so learned, so distinguished in our profession, and who has contributed so much to its advancement, should advocate the idea of contouring space. I agree with him as to retaining the conformation and shape of the teeth, thereby maintaining the interproximate space. I do not understand how we can contour space. Space is an indefinable kind of something. Space is so great between us and some of the stars of the universe that astronomers tell us that the rays of light are only just now

reaching this planet of ours. As to the shape of the space, the character of the space for the maintenance of the functional activity of the gum, let Dr. Miller, let Dr. Black and everybody else say what they may about it, we know that one of the principal factors in the establishment of dental caries upon the interproximate surface is the derangement of the functional activity of the contents of the interdental space, brought about by pathogenic microorganisms as shown in the beautiful drawings he has presented. Whether the microorganism antedate the other condition or not, I am not here to discuss. The derangement of the tissues passing through the interdental space is a prominent factor in the production of decay upon the proximal surfaces of front teeth. When the osseous tissues become compressed and their functional activity is impaired, or where we have stasis or a cessation of functional activity of the parts, there we will have an organism which is additionally subjected to processes of decay.

Dr. W. H. RICHARDS, Knoxville, Tenn.: I am here to learn, and the best way I have found for acquiring information, is to ask questions. In a recent conversation with Dr. Black, I ascertained that he does not use matrices. In my reading after Dr. Black, I have come to appreciate the value of the microscope, and particularly what he says in regard to the flowing of metals. I never used to think that amalgam looked like an iceberg flowing from the center gradually out of the cavity. I have been taught by him that such is the case, and it has been constantly observed by other men in the profession that the crushing power of gold upon mastication brings about the same condition. I asked him if it was not scientific that a body moves in the direction of least resistance. He says that it does. Now, then, if such is the fact, how can you expect to obtain sufficient pressure against a tooth in the act of filling it, unless you have a matrix held sufficiently firm by a screw or otherwise, so as not to disturb the pressure and prevent that flow that would likely and most naturally occur under the hammer. For my benefit and for the benefit of others, and because he stands out boldly in the profession, I would ask him to explain, if he takes the position he does, if the other is more strictly scientific.

Dr. BLACK (closing the discussion): I have not many words to say in closing. I thank you for your hearty expression of appreciation. I have taken notes of a few points that have been brought out by those who have discussed my paper, but I do not

think it will be necessary or perhaps well, for me to refer to all of them now. It is getting late, you have been patient and somewhat crowded, and perhaps something substantial for the inner man would go well for most of us.

In regard to the matrix I will say one word, and that is, that I am very happy in the fact that I can get along without it in filling with gold even upon distal surfaces. The matrix is always more or less in the way of making good margins with gold. I should like to discuss the plans of doing this extensively, but now is not the proper time.

As to contouring space, what is a sphere except a contour of space, or any other form that we choose to take? Now, as regards the teeth, let us try to take care of what is left of them. It has become simply a question of expediency; the cutting away of more or less tissue that has already become injured is not a question of sentiment. It is simply a question of expediency. How can we produce the best results? More or less loss of tissue does not enter into it. The arc form of the seat—bring pressure upon that or that (illustrating, showing a circular form and a square form) in any direction you please, which will move the quicker? That is all I have to say. It is one of the most important items in the filling of teeth. I care but little if your anchorage be slight, if you have your filling well seated it will not move, provided it is sufficiently dense. Will a dense tooth resist the progress of caries and render it slower, or will it be more rapid in a tooth less dense? I do not know except from what I might reason out. We know that chalk will dissolve more rapidly than marble, and I should suppose that a tooth less dense would dissolve more rapidly than one which is very dense. But the difference in teeth is too little for this to account for much. We know from observation and experience that the hardest teeth will be dissolved very rapidly under some conditions, while the softest teeth may be totally immune from caries. I thank you very much for your attention.

Adjourned.

CHICAGO DENTAL SOCIETY.

The meeting was called to order by the president, Dr. Ottlofy, at 8 p. m. February 1, 1897, evening session.

Dr. T. L. JAMES, of Fairfield, Iowa, read a paper on "Hereditary."

DISCUSSION.

Dr. S. H. GUILFORD, of Philadelphia, Pa.: We all recognize the fact that there is such a thing as heredity. Nothing in nature is more certain, more distinctly marked or more fully proven. We see evidences of it every day, both in the animal and vegetable world. It is a singular thing in one respect, and in another respect it is very natural that it should be so. And yet the law of heredity is irregular in its workings—it does not always work uniformly. I do not know why it is, but we see evidences of it constantly. One peculiarity is its inconsistency of operation; that sometimes a peculiarity which is transmitted skips a generation. It will appear in one generation, not the next, and then appear prominently in the third. We see evidences of that in transmissible diseases. We see a family, for instance, of consumptives, or certain members of it, who are consumptive; the next generation may be entirely free from it, while the third generation will show evidences of its inheritance.

Another peculiarity about the operation of this law is the tendency to revert to the original type. We take, for instance, that mingling of races by which we have the mulatto and the quadroon and eventually the octoroon, almost as white as ourselves, and yet very frequently a child of octoroon parents will be born that is perfectly black. This is nothing more than a case of reversion to the original type. It looks as though Nature did not exactly like this matter of the transmission of peculiarities, and that in a sort of rebellious mood she determines sometimes to assert herself and reproduces something of the original form of type.

Now, in our specialty of dentistry we see evidences of this every day. The essayist has spoken of cases in which peculiarities as regards the arrangement of the teeth are manifested or are transmitted from parent to child and are frequently very constant in their operation. But it is not only in that way, it is also sometimes in regard to the peculiar formation of teeth. I remember having had some years ago a family under my care in which I noticed a very singular peculiarity. I did not know the parents,

who died some years ago, but of the five children, three had devitalized right central incisors, all of them brought about without any apparent cause. Two of them were girls and one a man, and it seemed as though they had inherited that condition, as far as I could understand it, from one of the parents. Now, it seems queer that a tendency toward the devitalization of a pulp, without any apparent cause, should make itself manifest in that way, and it was so clearly shown in this case that I could not doubt it for a moment.

Then, again, in regard to cases of irregularity, as I said before, we see them so constantly that when we undertake to correct them it is very common with those of us who pay much attention to that subject to have a strong desire to learn the condition of the parents' or grandparents' teeth, simply to ascertain whether the condition that presented itself was really hereditary, or acquired during the life of the individual.

Dr. I. P. WILSON, of Burlington, Iowa: I remember a few years ago reading some of the writings of Prof. Weissmann, of Berlin, a distinguished biologist, and he took issue with the Darwinian theory. He held that no acquired character is transmitted. I have never seen anything to convince me that there was anything hereditary when a disease was acquired.

We need only look back over the history of time for a verification of this. I hope I may be pardoned for mentioning one thing that comes to my mind, namely, a religious ceremony that has been practiced ever since the time of Moses, that of circumcision, and it is practiced to-day just as it always was and there has been no physical change because of it.

We notice it in sheep that have been de-tailed, for instance, but no one ever hears of one being born with a short tail. Now, if an animal is born with any variation or deformity, there is no question at all in my mind but that deformity may be transmitted and become a fixed type in time. Let me illustrate:

I knew a man who was born with two thumbs on each hand and only two fingers on each hand; the hand was divided up to the wrist. His feet were deformed in a similar manner; otherwise he was the most perfect specimen of physical development. He married; there were three children the result of that marriage, and all of them were deformed in a similar way, but not so completely as the father, double thumbs perhaps on one hand, I do not remem-

ber exactly, but every one was deformed. Now, apply it to the lower animals and if some variation from a regular type has occurred and it is a desirable thing and the breeder has gone to work to inbreed, he could develop a type that would become permanent. There is no question about that. Here were those children, and if there had been an in and in-breeding, that type could have been established. There is a variation, a deformity, and it is so in fruits. The seedless orange, for instance, is an example of that kind. A tree was discovered without any seed, the kind we have here, so I have been reliably informed by an orange grower, and it was thought to be a very desirable orange, and so they commenced grafting and we have the navel orange, which in the first place was a sport. But by removing the seed, or in any way destroying the seed of that orange in its early stage of growth, he could never have brought about that thing in my opinion.

I think of a family now where the mother died of consumption, but that was the only case of consumption known. In the family back to the great-grandparents on either side, a case of pulmonary consumption had never been known, and yet here was a regular case of the disease. She took cold only a short time before her marriage and it settled on her lungs. She bore four children with that lung trouble still hanging on and finally died of consumption. Not one of those children have inherited the disease. I notice, too, that insurance companies pay no attention to such an occurrence; that if they ask the question, What did your parents die of? Mother died of consumption; then go back to grandparents, they died of consumption—they pay no attention to it. They do not consider that an unfavorable symptom, as I understand it.

I was very much interested years ago in reading Galton's "Theory of Heredity," he being an English biologist. He went on to explain how it was that in so many cases distinguished men, for instance, sprung from families of very humble origin, and he reduced it to a mathematical problem. I do not remember the illustration he made exactly.

Dr. JOHN S. MARSHALL: If I understood Dr. Guilford rightly—perhaps it was a *lapsus lingue*, he said that consumption was an inherited disease, or, that it could be inherited. I do not think he meant to say that. The best authorities to-day say that consumption is not inherited; it is not transmitted from father to

son, nor from mother to child, but there is an inherited predisposition, on account of the previous lowering of vitality on the part of parents, but not a disease which is actually transmitted from parent to child.

Dr. Wilson referred to the case of a woman who bore three children after she had lung disease, and said that neither of the children had consumption, but they might have it; they have it sometimes, but it is acquired and not inherited.

He also said that life insurance companies make no note of it. They do. I happen to know, because I have been for several years an examiner for life insurance companies, and I am not allowed to recommend a man whose father or mother died of consumption, until that man has passed, at least, his fortieth year, because he inherits a consumptive tendency. If he happens to talk a cold and comes in contact with some one who has tuberculosis of the lungs and breathes the tubercle bacillus, which may be floating in the atmosphere he is likely to have consumption, for the reason that he has inherited a predisposition or tendency to the disease, consequently life insurance companies would not take him before he had arrived at the age named.

Dr. THOMPSON, of Topeka, Kans.: I think this is a difficult matter for us to discuss. We all know the rules and results of heredity. The matter of heredity is not really the important one, but it is a question of variation. Variation has been studied by the great biologists and rules have been worked out in a more or less correct way, but still there is something beyond that which we do not fully understand. The theory of heredity which Dr. James presented is a very good theory of reason for advances in reference to that, especially with regard to the theory of Dr. Weismann, to which Dr. Wilson refers, and, after all, there are a great many things above that none of us can find out.

But the important question is that of variations, and these are so peculiar and so remarkable that there have been vast theories erected upon them, especially as regards the whole principle of evolution, which is founded, more or less, upon the study of variations.

We are, perhaps, more especially interested in regard to the variation of the teeth than in regard to anything else, and there are certain things that can be explained from hereditary principles and others again that cannot, so that it is rather an indefinite mat-

ter for us to consider without having more data than at present at our command.

I am disposed to look upon these things from a zoological standpoint and view man as an animal, regard his teeth as those of an animal, and in that way there are certain things that cannot be explained in any other way definitely. For instance, in regard to supernumerary teeth; we are prone to look upon them as sports, but they are variations, a reappearance. Looking at them from a zoological standpoint, I think many things can be explained better than by viewing them from any other way.

Dr. C. E. BENTLEY: It is gratifying to know that such subjects are becoming, more and more, to be thought and read of by members of our profession. There are many facts hidden in this subject of heredity that are directly applicable to our profession. The laws of heredity are pretty well understood by scientists today, but a full understanding of the subject necessarily includes the fundamental principles of evolution.

Atavism, or a tendency to reversion, is not, in my opinion, an acquired trait that can be handed from parent to posterity. The instances that have already been given by Dr. Wilson are in my opinion an arrest of development rather than an acquired trait. That is, the shuttle in weaving the fabric of an organism was at some stage of its prenatal existence interfered with, by causes unknown to men. The rhythm was broken—at the period of its development in which this interference occurred this was an arrest of development of the organ affected. If we accept the doctrine of evolution we accept also that we rehearse the in utero history of our antecedents. That is to say assuming all life started from a primordial cell and the various forms and modifications are the result of a potentiality within that cell, and that the tendency of that cell is to vary its form, and that nature protects a variation, we accept that we are a crystal from nature's retort and all animal life has contributed to our making. Evolution postulates that man is an incident in the cosmos, and that all life is dependent upon some preëxisting form of life. If we accept these postulates we can account for many variations that we find in man, both mental and physical.

This phase of life formation and interference with its rhythm is illustrated in many ways, for instance a child is born with six digits. The effort here, on the part of nature, when the interfer-

ence happened, was to revert to the fish ancestor, or to represent the typhal organ in the fin of a fish. This reversion accounts for the physical monstrosities we see in our museums, and the mental monstrosities we meet in the idiot or genius.

There is a question also about this subject of heredity that ought to go along with it; I cannot see how the two can be divorced, the subject of environment must always be considered, and right in this connection I want to mention a point to show you the force of these two contending factors. The one is always pitted against the other. Which is the more potent for the making or unmaking of the individual, you may draw your own conclusions.

It is stated by experimentalists, that you can take a crow and let it be hatched by a hen and that crow will be a hen to all intents and purposes. It will roost with the chicks and it will brood under the wings of the hen at night and to all intents and purposes it is a chick. But the moment it can escape and get back to its crow family, its crow relatives, the force of heredity being so strong it naturally acquires or takes upon itself without any tuition on its part all of the actions and all of the peculiarities of a crow. That is an example that shows you the force of heredity. But in a number of generations of crow, the modifications would be so great, one could hardly know a crow from a chick. This is illustrated in the canine family, the pug and the mastiff coming from a common stock.

There is another suggestion that I wish to leave with you in connection with environment. Suppose to-night there were born a babe in the chamber of a Harvard professor, and at the same time to-night there was born a little papoose in the hut of a Comanche Indian. Transpose these two agencies, the papoose into the chamber of the Harvard professor and the child of a Harvard professor into the hut of a Comanche Indian. In twenty years who can tell which potency will make for the actualities of life, or go to make for all that is good in civilization.

There is another thing I would like to mention, concerning this subject upon peoples. In 1895, a reviewer of books made a very pregnant suggestion about the civilization of nations. He said that there had been two great works that had been written during that year, one of them was by Gen. Booth, "In Darkest England," and the other was by Stanley, "In Darkest Africa." One of them represented a nation that in the mixing of nations

had produced a Gladstone; the other was in the formative period of a races making that who could tell what its existence or its ultimatum would be. In other words, the writer said that the English people had reached the pinnacle of fame, had reached the topmost round of the ladder of civilization and were descending, but that in the case of the benighted African, he had caught the first rays of God's sunlight and was looking upward and forward and his tendencies were upward and forward. In the course of time who can say where these tendencies will end.

Dr. TRUMAN W. BROPHY: I desire to say only a word, and what I shall say on this subject will be in relation to the influences of heredity from a clinical standpoint. I have had in my experience some evidences, which to me were quite clear, that these conditions revert back to prior generations, at least the third, and what I will say in regard to a single case might apply to many others.

Congenital cleft palate and harelip, in my judgment, in many cases are due to the influences of heredity. In one little town not many miles from this city, five children having been born in one family, three of them were afflicted with cleft palate and harelip. The parents were free from this deformity, but the grandfather upon the mother's side was thus afflicted, and having occurred in so many cases in a single family it made a deep impression upon me, and since that time I have taken the pains whenever these patients come to me (and I will state in passing that eighty-three have applied to me for advice or treatment in the last sixteen months) to make close inquiries, and in quite a large percentage of the cases I have found that somewhere back in the second or third generation this deformity existed. I do not say in the majority of cases, but in quite a large percentage of them this condition existed. I do not wish to speak of the many causes that have been assigned to this deformity, but I mention this and I sincerely believe that influences are transmitted to the third and fourth and fifth generations, and we see the types which I think are sufficient evidence to us that they existed. My friend, Dr. Thompson, a number of years ago wrote many articles on the eventual suppression of the wisdom tooth in man, and I expected when he rose he would tell us of those observations, for there are many young men and young women here who have not read those articles. The whole trend of those contributions was to show that

this was due to heredity, and that the loss of these teeth, generation after generation, would lead eventually to the suppression of the wisdom tooth in man.

Dr. A. W. HARLAN: The paper of Dr. James I did not have the pleasure of hearing read, but from the discussion, so far, I would like to draw some deductions. One of these deductions is the part that heredity plays in the transmission of bodily deformities or defects or additions to the proper ornament of the human body; that is to say, we have men and women who have a missing incisor or a missing bicuspid, or who have six fingers, three thumbs, or six toes or congenital cleft, or they have some other physical deformity or monstrosity that is transmitted from generation to generation, finally being lost.

Now in reading the works of all the celebrated novelists and psychologists of the past one hundred and fifty or two hundred years, I have found that the greatest thinkers have placed the child of a rich man in the hut of a poor man, and the child of the poor man in the house of the rich one, and then they have gone on and traced the career of the two children, giving their environment, but invariably at the end of volume one, or volume two, or volume three, all of the peculiarities of the parent of the child, in spite of the environment, have been transmitted to the generation, and if they had a tendency to the perpetration of crime, or anything like that, it crops out. I argue from this, that either these men talk about something that they know nothing about whatever, or that they have been great students of human nature and everything related to it, and that they have found that it is an utter impossibility to take the offspring of one grade of humanity, we will say, and transplant it to five or six or eight or ten grades above it, and in a single generation make it fit for that. And so, I would say, that in heredity the transmission from the very lowest stratum to that of the highest would take generations and generations, before peculiarities of physique and the mind become fixed facts.

Dr. J. N. CROUSE: I do not know anything about this subject, therefore I would like to have you excuse me, after I give you one illustration, which, however, is not original with me. There was a time when the dental profession did not agree very well; they quarreled among themselves, and a very quiet, careful, thinking man thought it out and he said that he was satisfied that the dental profession originally came from the porcupine race and they

had that tendency yet ; they did not have the quills to throw out, but they threw out their spite at one another.

Dr. JAMES (closing the discussion): It seems to me, the speakers have indicated a desire to go to the point too quickly. Dr. Harlan has asserted that it must be persistent, it must be necessary to pass through many generations before much is strongly perceptible. That is very explicit.

Now, in the particular instances I cited, they did not come directly under my notice, but they came from people of reputed truthfulness. This man Lockwood, of New York, who has been able to produce a generation of tailless mice, is a man of undoubted judgment and scientific attainments, and his word in other respects has always been taken as genuine. I do not doubt for a moment that he has succeeded. I stated in this paper that in ninety-six generations he was able to produce a generation of tailless white mice. It did not require ninety-six different generations. Within ninety-six generations he had not only produced tailless generations, but he had returned again to the mice with tails in that eight years.

In the matter of atavism, as has been mentioned, we read and know of many instances where in the first succeeding generation there is no seeming indication of the transmission, perhaps in the second or in the third there is ; but we have records of where they have in the fourth generation and even in the fifth, had positive indications of deformities or otherwise as in the original. We seem to strike the same thing five or six generations back, and after that intermittent space there would appear these variations and deformities.

[TO BE CONTINUED]

BANQUET OF THE CHICAGO DENTAL SOCIETY.

The banquet of the Chicago Dental Society took place at the Palmer House on Tuesday evening, Feb. 2. Dr. Louis Ottofy acted as toastmaster.

The toastmaster, after rapping for order, said: " The first time that Chicago appeared upon the dental stage was in 1865, when the American Dental Association met in this city, and of the one hundred and twenty dentists who attended that meeting, about twenty-five are still among the living, and of those who were here thirty-two years ago two are with us to-night—Dr. H. A. Smith, of

Cincinnati, and Dr. A. W. Freeman, of this city. I will ask the society to drink a toast to their health. The second time was the occasion of the meeting of the American Dental Association in 1877. The third time was the twenty-fifth anniversary of this society in 1889, when our late lamented Dr. James A. Swasey occupied the chair. The last occasion, preceding this one, is still fresh in the memory of nearly all of you, the World's Columbian Dental Congress, in 1893. No occasion, excepting the last, was so grand as the one which is about to terminate. The clinics of the last two days have been remarkably successful ones. There were originally announced by the printed programs which were sent out sixty-six various subjects, operations, papers and exhibits, that were to be presented to you during the two days as the regular order of business. Some of the clinicians failed to come, but through the energy of the chairman of the committee on clinics those places were filled, so that practically everything that was promised you has been fulfilled. [Applause.] Now, then, to the toastmaker's sentiments:

"Let us have good cheer and joy;
Sorrow and sadness hath no place here."

I wish to present to you, as the first speaker of the evening, a gentleman who needs no introduction, who will respond to the toast "Welcome,"—Dr. A. W. Harlan.

"Friends,
One and all, we rejoice to welcome you
Within the portals of our home."

Dr. Harlan said:

Mr. Toastmaster and Gentlemen: When we were getting up this program, about 11 o'clock last night, I told Dr. Ottofy that if I had anything to do on the program he must surely put me down for a speech of welcome, because it was in addresses of welcome that I excelled, and he said, "I will put you there."

The occasion of your meeting here the past two days was one of anticipated pleasure to me, because it fixes in my mind two anniversaries, and to night it makes a third. Twenty-eight years ago to-day I arrived in Chicago; twenty-five years ago to-night I became a member of the Chicago Dental Society, and to-night I assist in the celebration of the Thirty-third Anniversary of this Society, and it gives me great pleasure to welcome you to Chicago, even though it is at the time you are about to depart. I hope that

your stay has been profitable ; that you have been well taken care of, and I am sure that every member of the committee on clinics and other officers of the Chicago Dental Society have done everything possible within the time at their disposal to give courteous attention to every one who is a stranger within our gates. We hope this feature of midwinter celebrations will be continued by Chicago or other cities in such a way that every one will feel repaid for leaving his home and his practice and coming and seeing the new things that have been developed and evolved and invented by members of our own profession. In behalf of the officers of the Chicago Dental Society and the clinic committee I bid you all a hearty welcome. (Applause.)

The toastmaster: The next toast is entitled : " The Effete East."

" The East still hath her charms,
Less pretentious, yet beautiful, withal."

I will ask Dr. Guilford, of Philadelphia, to respond to that toast.

Dr. S. H. Guilford arose amid much applause. He said: In discussing the subject of heredity last night I was not very happy in my remarks in that I forgot to mention one thing, and I desire to call your attention to it this evening, and that is the fact that I myself am a living example of heredity, because I know that those who are most intimate with me recognize the fact that I have inherited from my ancestors two traits. One of them innate modesty, and the other a very retiring disposition. (Laughter.) On that account I feel I should not be called upon this evening to hold up the eastern end of this question. When Dr. Ottofy stuck a piece of paper into my hand it was the first intimation I had that I was to respond to the toast, " The Effete East." It seems to me it was in very bad grace indeed for Chicago to say anything about feet. (Laughter.) I do not know that the East is exactly effete. I know that she has educated some of the men who are the leading educators to-day in Chicago and in the West, and for that she must certainly have credit. Whether the literary center or professional center has been removed from Philadelphia to Chicago, as your toastmaster has intimated, I am not going to say. If Chicago is not the literary or professional center of this country she is nearer the geographical center than Philadelphia, and that is to her credit at all events. (Laughter and applause.) I know

very well that the East does not claim to be progressive in all things. Perhaps the East has done so much in the past that she is now standing still. In some respects the West has outstripped her, and I have never been more forcibly reminded of it than during my present visit to Chicago. In many respects you are certainly far in advance of the East. I traveled to-day on cable cars and was drawn around corners by horses. We have nothing of that kind in the East. (Laughter.) I have noticed, too, that business men in general are so thrifty here that the stores and buildings are not able to contain all of the merchandise, and that therefore they have been crowded out onto the sidewalks. These are some of the things in which we are behind, and I make no bones about confessing it. (Laughter.) I do want, however, to congratulate Chicago and the members of the Chicago Dental Society gathered here to-night. I was agreeably surprised when I came into this room to find so many assembled here. To tell you the truth, I was literally amazed, not because I thought you did not have enough members, or rather dentists to fill this room, but because you have been able to get so many together. As a rule, when a society gives a dinner nearly every one of its members turns out, and it is natural that certain others should come with them to attend the festivities; but it is not a common thing to find a congregation of professional men, such as we have here, that in numbers will probably quadruple the number of members in your local society. Frequently those dentists not particularly interested, even though invited to a banquet, will not come out for some reason or other. That is true in Philadelphia, and it is true in New York to a certain extent. I have attended a great many banquets in both cities and I question whether in New York as many dentists ever gather together as are here to-night. I doubt whether I have ever seen so large a gathering of dentists in the East, except in Philadelphia when we celebrated the Wells memorial. This large attendance indicates one thing, and that is, you are all harmonious; that there are no bickerings, no jealousies, and that no ill-feeling exists between the members. At least that is the way I interpret it, and it is very much to the credit of the dental profession in Chicago. Philadelphia is called the City of Brotherly Love, but I believe there is as much fraternal feeling here as there. I feel, Mr. President, that, aside from the clinics we have had and the discussion on the papers, as well as the

friendly intercourse I have enjoyed with every one whom I have been brought into contact with, that I have been amply repaid for my long journey. When I was revolving in my mind the question of coming to this meeting or of staying at home I thought of the many occasions when members of this society, like Drs. Harlan, Black, Brophy and Crouse, had taken the time and set aside their work in order to visit the East when we had invited them, and so I decided that it would only be courteous in me to respond in the same way. And now that I have come I feel fully repaid, and I wish to convey to one and all, as a representative of the profession of Philadelphia, the most cordial and fraternal greetings. (Applause.)

The Toastmaster: I introduce to you Dr. J. Y. Crawford, of Nashville, who will respond to the toast "The Sunny South":

"The South,
Sweet land of the cypress and myrtle
And everlasting sunshine."

Dr. Crawford was enthusiastically received and said:

Mr. Toastmaster, Gentlemen of the Chicago Dental Society, and Visiting Dentists from other Sections of the Country: It affords me pleasure to respond to the toast as indicated upon the program for this evening, "The Sunny South." I do so not only with pleasure, but I respond with pride. While I would not be sectional at all in my feelings, and while I congratulate the American people that the seemingly once wide bloody chasm has been reduced to an imaginary line, not much longer than the red line that was drawn through the original Declaration of Independence, written by Thomas Jefferson, in which the request of universal liberty was incorporated, there is merely an imaginary dividing line; but beyond the old Mason and Dixon's line there are twenty-odd millions of white people and some five to seven millions of black people whose loyalty to-day to the stars and stripes and the ensign of the Republic is as much to be relied upon as the same number of people coming from any portion of this country. (Loud applause.) If it should become this present civilization to practice the example set by one of the nations of the past, the ancient Egyptians, and should conclude to erect a monument upon American soil proposing to perpetuate and commemorate the material characteristics of our institutions, I would suggest that that monument, located upon the various lines of latitude and longitude, be not

square, but that its base be triangular, and that one side look to the east, one side to the west and another side to the south, and let each side be composed of good quality marble selected from the quarries of the different sections, the granite of Vermont, the granite of Massachusetts, the peculiar rocks of Pennsylvania, the marbles of Georgia, the marbles of Carolina and the State of Tennessee, mingled together, shall make another side; let the West, with its abundant production and resources, have its side; let the names of distinguished statesmen and warriors from the East be inscribed upon the eastern side; let some distinguished men from the West have their names inscribed on the west side, and I can afford to come from the South and put first on the entablatures upon the south side the name of a man who was styled "the Father of his Country." Upon the same side Thomas Jefferson's name can be inscribed, as well as the name of Abraham Lincoln, and upon the same side there can be inscribed the name of one who was dear to our hearts—the peerless Lee. (Applause.)

We ask unanimous consent to place upon that side another entablature, the name of the State of Maryland, the first State to incorporate an institution of dental learning; and further along down the same side, representing the South, we would ask unanimous consent to have it there stated that when there were only thirteen men in the world holding the degree of doctor of dental surgery, ten of them lived south of Mason and Dixon's line. (Applause.) Our history is so rich that we could fill that side as it turns its broad face to the sunlight of heaven. Let it be stated in unmistakable language that we commiserate any mistakes we have made; that we are sorry for any wrongs we have done in the past.

But in the reparation we give to the American people, we offer to the dental profession from the South all the loyalty, all the effort and help we can to elevate the noble profession that we love so much. Again, I would suggest upon that triangular monument on the East side, there be inscribed the words by the Eastern people, "We know no East, we know no West, we know no South," in devotion to our country; and then on the West side of the monument let there be inscribed that in love and loyalty to the Constitution and Union, "we know no East, we know no South," and I am sure that the Southern people would like to come *en masse* on the Fourth of July and bring with them some Southern man and let him stand, while the inscription is being made, and say

that "we are for the Union now and forever," and let it be inscribed upon the tablet. We are not only for it, so far as the government is concerned, but so far as the dental profession is concerned (loud applause) and I hope the time will soon come when there will be no distinctive American Dental Association, no distinctive Southern Dental Association, but one grand association to which we shall all belong, and that gathered around this splendid towering pedestal we shall hold our annual conventions. If we are given the opportunity and have the aid of the dental profession, we will put Harlan at the head and have an occasion equal to, if not surpassing that of the World's Columbian Dental Congress, or the discovery of the American Continent by the Spaniards. (Loud applause.) Gentlemen, in all seriousness I would like to have upon the top of that monument a magnificent Goddess of Liberty; I would not let it stand like the pyramids of Egypt, as a solemn watchman over the peculiar Sphinx that represented their ideas of religion or the deity of the past, but I would like to have her eye turned toward the East, fixed not upon any mythological fable of the past, but in hope and in faith upon the Star of Bethlehem, indicating to the world that to the East we are to look for hope, strength and encouragement, and by all means, let that stand not only as a monument in honor of our institutions, but as a perpetual announcement to the world that we believe in the Father and the Son and in the Holy Ghost. (Uproarious applause.)

The next toast, entitled "The Frozen North,"—

"Ye Gods of Olympus!
Give me forty below zero
And my heart shall rejoice."

was responded to by Dr. Thomas E. Weeks, of Minneapolis. He said:

Gentlemen of the Chicago Dental Society and Visiting Brothers: This is a rather cold subject to expect a man to warm up on, and I was somewhat at a loss to know exactly what my friend Dr. Ottofy expected when he handed me the little slip containing my toast. I was certain that he did not intend to give us of the Northwest the marble heart, or anything of that kind, but possibly he had in mind the desire to find out whether there was anything warm in the Northwest, and I assure you, gentlemen, that there is, and it is the hearts of the dental profession in the Northwest. I am sorry there are not

more representatives of our State here to-night, but I am proud of those who are here, and because of that pride I feel all the more the compliment of being asked to speak for them and for our brothers who are unavoidably absent. I know there are many whose names, if I should recall them, you would recognize, who are with us in spirit. Many of them asked to be remembered individually. I am sorry that they cannot be here to speak for themselves. I am more than proud of being invited to make the effort in my poor way to express to you the sentiment of sympathy that exists between the dentists of the Northwest and those of Chicago and of the East and South. There was once held in our city a representative gathering of the American Dental Association. As I remember it, it was a very successful meeting because our brothers from the East and South responded very liberally by their attendance, many of them coming from a great distance, and we hope some time in the future to have the pleasure of again welcoming you to the Northwest. Of course, Chicago is a great city, but Minneapolis is a great city, too, and it is undoubtedly a great city in the minds of some of the people in Chicago, as a gentleman in introducing another from our sister city said, "this is Dr. Blank, of St. Paul, Minneapolis," (laughter) so that there are some in Chicago who recognize Minneapolis as great, and I would suggest that possibly it might be well for you to look to it that history does not repeat itself, and that the center of dental education does not travel farther west. But seriously, gentlemen, if we need anything to assure us of the sympathy and the charity and brotherly love in the dental profession we need go no further for an illustration than this gathering for the past two days in Chicago. It certainly contains as much of that spirit which illustrates the sentiment as I have ever seen in any gathering.

I thank you for giving me an opportunity to speak for my section, and I hope that we may be able to grasp you all by the hand at some time in the future and bid you welcome to the future center of dental civilization. (Applause.)

The Toastmaster: Some one has kindly passed up a note that is of historic interest, it states that at the meeting of the American Dental Association held in this city in 1865, Dr. Atkinson filled a tooth, using the rubber dam, it being the first time the rubber dam was used to fill a tooth. I presume it means, the first time in the West.

We expected to be with us to-night a gentleman from Philadelphia, one whom you know very well, Dr. W. G. A. Bonwill. He has thought of us and sent us the following toast, to which we will now drink,

"Let us drink to each other and to every brother,
Mutual lovers we long may be;
In this cup, let us drink and be ever,
On the brink of love's deep and boundless sea."

The toast, "The Wild and Woolly West,"

"Hearken! a voice
From the wild and woolly West,
The home of the populist and popocrat."

was responded to by Dr. W. E. Griswold, of Denver, Col. Dr. Griswold said:

Mr. Toastmaster and Gentlemen: I regret that I could not persuade our honored toastmaster to leave my name off the list of speakers, for I am neither wise nor witty (A VOICE: nor woolly), and I feel this is an occasion that would tax the energies of the silver tongued orator who lately figured as a possible candidate for the greatest gift of this great nation. The term "wild and woolly west," I do not think is entirely applicable to the centennial State in which I am proud to have a home. Woolly would seem to me to be more applicable to that State where the citizens are so industriously planting the seeds for possible future presidential candidates which is one of their chief products. (Laughter.)

While we have a rough and rugged country shaken by the mighty hand of nature, we have cañons which bring forth exclamations of wonder and delight. Some parts of our State are peopled with those sturdy men who, with shovel and pick, delve into the earth and produce precious metals which make the possibilities of dentistry what they are. The people of Colorado are as bright, as energetic, as well educated and as refined as any that this nation affords. They are people who are bound to make of the State and of the city of Denver, which is its capital, a second Chicago, in so far as an inland town can be. What more could we ask for?

I wish to return special thanks to the clinic committee for personally remembering me with the request to attend this meeting. It has been a feast of brain and belly, I might say, which I would not have missed for a great deal, and I sincerely regret that more of my professional brethren are not here to participate. In the

language of the Presbyterian preacher I wish to express special thanks to the clinic committee and to hope as they grow in years, their hairs grow gray and stomachs pout out, that they will never cease in their ability to chase after the rich man's check; that as they go to that home which is especially prepared for the practitioners of our profession this epitaph may be written over their remains:

" Here lies Dr. Blank,
Whose heart was so big and so generous.
That his liabilities exceeded his assets."

(Applause.)

Dr. Crawford: I ask unanimous consent that you all rise and join with me in drinking to the health of the Chicago Dental Society, coupled with three hearty cheers.

(This the members of the society and invited guests did and made the banquet hall ring with their cheers.)

The next toast, "The Great Valley," was responded to by Dr. J. D. Patterson, of Kansas.

" He hath built himself a dwelling
On the shores of the beautiful Missouri "

Dr. Patterson, on rising to speak, was greeted with applause. He said :

Mr. Toastmaster and Gentlemen : I am sorry that I cannot treat this subject as it certainly deserves. When the little slip of paper was handed to me which imparted the information that I was to respond to the toast, "The Great Valley," I did not know but what Dr. Ottofy meant "Coon Hollow," but I made up my mind that it was the great Mississippi Valley. The celebrated Valley of the Rhine with its castellated ruins ; the beautiful Valley of the Rhone ; the beautiful Valley of the Hudson in our own country ; the beautiful Valley of the Shenandoah and all the beautiful valleys in the country, sink into utter insignificance when compared with the great Mississippi Valley, not in picturesqueness, but in great value.

I wish to say a few words along the line of what the dental profession owes to the Mississippi Valley. Many of you know what the record of the Mississippi Valley has been, of the men it has produced, and what has come from that effect to the dental profession of the world. The Mississippi Valley Dental Association was one of the first dental organizations—shall I say in the world?—in the United States. It is over fifty-five years old. You may

talk of the effete East, of the wild and woolly West, but from the Mississippi Valley you have had the men who largely brought the profession to the proud position that it occupies to-day. (Applause.) Let me read a few of the names of the organizers of the original movement, and I refer you to the printed proceedings in the *Dental Register* of this old Association for confirmation of what I may say. Among the organizers were Drs. James Taylor, A. M. Leslie, C. W. Spalding, John Allen, Isaiah Forbes, W. N. Morrison, W. W. Allport, P. G. C. Hunt, Kennedy, McKellops, Taft, M. S. Dean, and as visiting members Drs. Dwinelle, Atkinson, Townsend, Chapin A. Harris, W. H. Morgan, Knapp, of New Orleans, Cutler, of Holly Springs, Miss., and Friedrichs, of New Orleans. Look over these names and see what has come to the dental profession from their efforts. Perhaps James Taylor did more toward the organization of that association than any other Mississippi Valley man. Chapin A. Harris, a Mississippi Valley man, a Greenfield (Ohio) man, established the first dental college in the world. James Taylor, also a Greenfield (Ohio) man, established the second dental college in the world—the Ohio Dental College. Dr. Atkinson was a Mississippi Valley man formerly of Norwalk, Ohio. This valley is great in natural resources of all descriptions. Although it is not so great in extent perhaps as the Valley of the Nile, yet the wealth that has grown up around its banks is astonishing and brings to our mind its immense resources. When I began to investigate the number of men who came from the Mississippi Valley and had taken an active part in the development of dentistry I was startled. The effete East I venture to say cannot bring an array of talent from any territory which I bring here to you to point out what the men of this great valley of which I am speaking have done in bringing the dental profession to where it is to-day. I wish I had the eloquence of some of the gentlemen who have spoken to-night; or if I had the ability to do justice to the subject I have in hand it would be the proudest and greatest thing I could wish to do. The ability to speak impromptu eloquently upon a subject like this ought to inspire any one, and it is something more to be desired than anything I have undertaken. I must leave the subject with you as I am not able to do it justice.

I have built a dwelling upon the banks of the Missouri. The only trouble is that there is as much mud in the river as there is on its banks. It is not a beautiful river, but its waters are being clarified slowly.

I thank you for the courtesy of being invited to speak. I have enjoyed being with you. There is no man who looks forward to these meetings with greater enthusiasm and interest than myself. I have always tried in my feeble way to do what I could for the profession; and while I have made mistakes I have done it unintentionally, because I believe in the profession most thoroughly and enthusiastically. (Applause.)

The next toast entitled "Unity,"

"We invoke union, power and strength
In the cause of science and knowledge."

was responded to by Dr. W. H. Richards, of Knoxville, Tenn.

Dr. Richards first thanked the toastmaster for calling on him, then he related two or three humorous stories and terminated his remarks on Unity as follows: "In regard to the effort on the part of the dentists of Chicago who have set so good an example as one man for the benefit of the scientific world, I would say,

"Onward, onward, oh ship of science,
At thy helm progression stands;
In thy face we see defiance
Of opposing shifting sands."

Gentlemen, I thank you. (Applause.)

Dr. McKellops, who was to respond to the next toast, being absent, Dr. H. A. Smith, of Cincinnati, kindly consented to respond to the toast "One of the Boys."

"Appearances are sometimes defective;
We may look old,
But our hearts are young and receptive."

Dr. Smith said:

Mr. Toastmaster and Gentlemen: I labor under great embarrassment; in fact, my heart is up in my mouth in attempting to respond to the toast which has been assigned to our distinguished brother, Dr. McKellops. Had I known that I was to be called upon to speak to you, or had I anticipated it at all, I should have held him by his coat-tails as we entered the room. You remember early in the evening some reference was made to my having visited Chicago years ago when I was a student of dentistry. I had not graduated at that time. I was told that there was to be a great assemblage of dentists in Chicago and I came up to the meeting of the American Dental Association. I remember that occasion very well and enjoyed it exceedingly. I met among others Drs. All-

port and Atkinson and some of the gentlemen whose names were mentioned to-night who have distinguished themselves in our profession, and I have been going to Chicago occasionally ever since to attend meetings, and on several occasions to attend the banquets of the Chicago Dental Society. I have always reflected on myself, and I have been doing so to-day. (Laughter.) As I go about this great city and see evidences of wealth, and while the dental profession regret exceedingly that I did not locate here and be added to the large number of millionaire dentists of this city, still in my humble way I have been trying to do my duty. When I saw the large and flourishing dental colleges you have here, I thought there might be room for another, and if I could select the right sort of men I know I could procure a charter and I am ready now to receive applications. (Laughter.) As you are to have a speech from another Smith farther down on the program, brother Holly Smith, I think out of respect to him I have said quite enough. We have great admiration for his eloquence, his wit and his capacity in all directions. Did you ever see him drink? (Laughter.)

While I must thank you cordially for this invitation to impersonate my friend McKellops, I wish you to remember the sentiment of the toast that "Appearances are sometimes defective." (Applause).

"The happiest mortal,
Tis he! for he doeth his labor of love
Without towels or water."

Dr. Junius E. Cravens, of Indianapolis, responded to the toast "The Clinician."

Dr. Cravens arose to respond amid great applause. He said:
Mr. Toastmaster and Gentlemen: My experience as a clinician is not very extensive. It seems to me the position of the clinician before one of these meetings is rather anomalous. He is a dentist without an office, and very often he is a dentist without a practice. The interest taken in clinics has been increasing from year to year. I think there was more interest and enthusiasm manifested in the clinics at this meeting than at any other meeting I have ever witnessed. I spent considerable time in watching my friend, Dr. Cigrand, in preparing and mounting a gold cap for the extension of a bicuspid that had partially broken away. Crowding is one of the inconvenient features of clinics, and I do not see how it can very well be avoided. It is necessary for the clinician to be ami-

able and cheerful and accommodating. He has to answer all questions; he has to allow gentlemen to look into the mouths of his patients, whether the patients wish it themselves or not. He allows dentists to pick up his instruments with some fear as to whether they will ever put them down again. (Laughter). I find the window sill a very convenient place to put the instruments and appliances that I want to use. If the clinician is wise he will bring all of his necessary instruments and appliances with him. When the time comes for the clinic he generally finds that he has forgotten some things. For instance, this morning it occurred to me early in bed that I had forgotten to provide sulphuric acid for my clinic. I was so nervous about forgetting it that I got out of bed and repaired to a drug store before breakfast and laid in a supply of it. Unfortunately many dentists come to these conventions as clinicians unprepared. They expect to find everything provided for them. Of course, they expect to be furnished with patients. Experience has shown that it is not always possible to provide clinicians with all they need. Every clinician should come prepared with what he needs. My debut as a clinician was made before the Indiana State Dental Association in 1876. I was down on the program to fill a distal cavity in a superior bicuspid with cohesive gold. I was nervous. It was my first experience. Everybody was inquisitive. They expected much more than I did myself. I got badly rattled. It was an abominable operation. A gentleman from the northern part of the State, who was a non-cohesive gold manipulator and a good one, not particularly distinguished for cleanly habits, who had long whiskers and boots that had never been polished from the time he put them on seemingly, annoyed me a little by constantly looking into the patient's mouth. I was not acquainted with the profession of the State then. In the afternoon, when there was a paper to be read on rubber plates, or something of that sort, he came over where I was sitting and said: "I am an older man than you, and I want to tell you that you are a --- fool." I replied, "I thank you sir." I felt he was right. He said, "This morning you put in a cohesive gold filling and it took about three hours to do it. I could have put in a better filling, using noncohesive gold, in twenty minutes." He then took an envelope out of his pocket and made diagrams of how it was done. I thanked him.

I want to say to my brother clinicians present, do not be dis-

couraged. "We are the people." The gathering, though large, about our clinic chairs was an honest crowd. While others were conducting their clinics I watched those that were looking on carefully; they were all fingering the paraphernalia, but I did not miss anything from my outfit and I do not believe others did. Everybody handled my pyorrhœa instruments. I took an inventory this evening after I got back to the hotel and I wish to thank the gentlemen for their honesty. (Laughter.)

I wish to congratulate the clinic committee and the colleges on the high class of patients that were provided. So far as I could see the clinic patients from the laity were above the average in intelligence and appreciativeness. I heard some of them express their appreciation and gratitude for what had been done for them.

In regard to the future of the clinics in the various dental societies throughout the United States, it seems to me they are bound to be progressive. They are becoming equivalent to university extension; they are a sort of college extension, an education not for students but for practitioners themselves—men who have gone out from the colleges and have embarked in practice. Perhaps every clinician, however humble he may be, can give somebody ideas to carry away that he did not have before he witnessed a clinic.

In regard to a certain class of gentlemen who get their names placed on the program as clinicians and fail to appear, and it is advertised to the profession who are invited to come and see the clinic, and those gentlemen making various excuses at the last minute as to why they cannot come, and others who treat the matter with profound silence, it is not treating the profession honestly. The man who permits his name to go on the program either for a clinic or for an essay at a meeting of his professional brethren, has no right to absent himself or fail to make it good unless he is so ill that he cannot come. I have made it a rule in the very few clinics I have given, or the papers I have promised to read before dental associations, to be on hand even if I had to borrow the money to go. (Applause.)

I want to thank the colleges in the name of my brother clinicians for the courtesies they have extended, and to congratulate them upon their splendid facilities, not only for clinical but for educational purposes. I want also to congratulate the Chicago Dental Society upon the energy and enterprise displayed at this

meeting, and particularly do I wish to congratulate the president, the secretary, and Dr. Harlan on the energy and push they have manifested in bringing this meeting to so successful an issue. Gentlemen, I thank you. (Applause.)

"The Cradle of Dentistry,"—

"Our forefathers have rocked him and nursed him
Till he hath grown to be a man."

Dr. B. Holly Smith, of Baltimore, responded to this toast. Dr. Smith was greeted with loud applause. He prefaced his remarks by telling a humorous story, after which he spoke as follows:

Mr. Toastmaster and Gentlemen: I feel that a more serious vein should possess our minds. When we think of the beginnings of the profession that we love and revere, when we consider that Chapin A. Harris and Horace H. Hayden were the courageous spirits who organized in the city of Baltimore a college of dentistry and tried to get the medical profession to adopt this weakling child and were rebuffed, when we contemplate the heroic resolve that possessed their hearts when they said we will launch this boat ourselves and weather the storms, it was a prophetic prediction. They proved themselves not only heroes, but indeed prophets. The dental profession to-day, gentlemen—I do not say it because we are dentists, but because I know what I am talking about—is a wonder to all civilized peoples (applause); it stands as the professional calling which has far outranked in its progress in the last fifty years all other similar callings. And I say it is with the utmost pride that I respond to the toast, "The Cradle of Dentistry."

"Our forefathers have rocked him and nursed him
Till he hath grown to be a man."

How much more robust, how much more athletic, how much more intellectual, who can say? But I say this, and I say it with a feeling of veneration, that whatever may be the future of dentistry, certainly the past is sacred; and at a joint meeting of the Washington City and Maryland State Dental Associations I offered a resolution to the effect that the American and Southern Dental Associations be petitioned and memorialized to set on foot some means which will look to recording the history of our profession, and especially to record the history of the lives of the men who have fought to make dentistry an honorable calling, men with

whom we associate, and who, much to our sorrow, are dropping away one by one. A little while longer it will be too late. For God's sake, gentlemen, let us start a movement which will record the history of the lives and the work of those men who have labored so faithfully for the cause we love before they die. (Applause.)

I thank you for this opportunity which seems to draw me closer to my professional friends. I have highly enjoyed myself; I have had a good time, and if the Lord spares me and I keep on filling teeth, or can secure a railroad pass, I will come again. (Loud applause.)

Mr. C. L. Bingham being called for, said: I am a plain ordinary business man and I am not in the habit of making speeches. I can present a bill or send a statement. However, it is a pleasure to break bread with you and to see you face to face. You are the friends of the institution I have the honor to represent. It is generally conceded that American dentists lead the world. The same may be said of American manufacturers of dental goods. You are doing all you can to raise the standard of dentistry. You believe in having the best things, in using the best goods. An attempt has been made in some quarters to lower the standard of dental education from the anxiety to get the almighty dollar. Do not do it. The best things will always bring the best reward in the end. It may be a hard struggle for us sometimes, but let us try to do that which is right, and by laboring earnestly, faithfully, constantly, we will win our reward in time. (Applause.)

I desire to avail myself of this opportunity as a business man to impress this thought, that while the temptations of to-day are very great, the temptation has not reached dentistry, nor our dental manufacturers in the way of department store business. Let us hope that it never will. We as manufacturers wish not only to keep pace with you, who are using the goods we make, but we try to furnish you the best things that come to us, and I believe the dental profession is willing to acknowledge this. I hope you will keep up the standard of dentistry. Don't let it down. A gentleman came to me to-day and said, "You are encouraging as manufacturers cheap dentistry, cheap men, those who are cutting down the receipts of the old-time dentists in the United States." Gentlemen, if ever an untruth was uttered, this is one, and I say so here. We love those of you who taught us as business men

what is the best thing in the end. The dentists of this country want the best and nothing else. Your patients want the greatest skill and best workmanship. The best dental goods are made by Americans. We want to keep pace with you. We are your friends. There is a sentiment in business. (Applause.)

Dr. Crouse was called for. He said: During the last two days I have had said to me several times that I would rather fight than eat. There never was a greater mistake made. If there is anything I love it is to fight for the right and accomplish it, and the fight we have recently won could not have been accomplished were it not for the combined efforts of the members of the dental profession united with those of the members of the Protective Association. The dental profession for thirty years, ever since I have been connected with it, has never been in the position it occupies to-day in that respect. And why? Because they saw fit to band together impartially and work for the end we had in view. There should have been a greater banding together, but still it will come. As the hour is late and I did not expect to be called upon to make a speech, I wish simply to say that the doors of the Protective Association are still open for others to enter. (Applause.)

The toastmaster: As the time for adjournment has arrived, on behalf of the Chicago Dental Society I wish to extend hearty thanks to all of those who have assisted in making this so successful a meeting. It could not have been accomplished but for the help of those who have left their business to come here, many of them from a long distance.

Inasmuch as we cannot form a circle to sing "Auld Lang Syne," I will ask Dr. Tuller to sing "Illinois."

Dr. Tuller then sang "Illinois," after which the audience dispersed.

MINNESOTA STATE DENTAL SOCIETY.

DISCUSSION OF PRESIDENT'S ADDRESS.

Dr. T. E. WEEKS: The suggestions contained in this paper are all so valuable it certainly cannot be discussed or disputed; if I may add anything at all I shall hope to add emphasis to what the essayist has said. In regard to the wish for an increase of membership, the query occurs how to accomplish it.

In fact that is a query that has interested me ever since the organization of this society. The society seems now, however, to be undergoing a revival. Last year we had a large increase in membership.

A large proportion of the membership added last year is here to day, and from the symptoms I think the increase of membership will go on this year, although there are many causes why this should not be so large a meeting as usual. It is a good way from the Twin Cities, where we usually meet, very near the great carnival season, just at the organization of the great presidential campaign, and at a financial crisis when everybody cries "hard times."

Even so large an attendance as this argues well for our society. I am glad to see the young men. I think the executive committee this year were wise in giving prominence to the social features; in coming together socially we cannot help being benefited. The greatest benefits I have received from our society have come to me incidentally, where a few get together and talk things over informally. Men coming together in that way, engaged in the same profession, are bound to talk about the things that interest them, and each is benefited by the talk with the other. So I hope the suggestion of the committee will be followed out in the future—that the social feature may be made an element, and if we need more than three days to have a good meeting and have a social time, let us have another day.

In regard to lines of study, I would mention three subjects that seem to be engaging the interest of the profession. Probably I would place first electricity—using the broader term, which comprises cataphoresis in its various applications. There is no doubt but that the application of electricity, in the broader sense, not only to saving labor to the dentist by running his machinery, but in saving pain to the patient, by intellectual application of remedial agencies. A systematic line of study in this direction could not fail to be of great advantage.

Then, we have amalgam, a subject so ably handled by Prof. Black and others. The professor gives us the merits of amalgam from a scientific standpoint. Prof. Black built his amalgam experiments upon the physical characteristic of the teeth. You hear men talking about hard and soft teeth and all that sort of thing, when it seems to the close observer that they hardly know what they are talking about. They talk about dentine, but it is the enamel that begins to decay. The dentine must be exposed first and the substance that protects it be broken or carried away in some manner. It seems to me the physical characteristics of the teeth and their environments is a broad field and this society might well take up the line of study in that direction.

In regard to the American Dental Association and its proposed plans for the future, or the part that we may play in those plans, it was proposed to meet at old Point Comfort next year, with the Southern Dental Association, for the purpose of consolidating the two. It seems unnecessary that the two large organizations should exist, and the leaders of the two organizations are trying to consolidate.

The plan is something like this: That there will be an agreement to meet once in the east, once in the south, once in the west, bringing the meeting of the new association, whatever it may be called, to the west once in three years, Chicago being the eastern line of the west; so that once in three years, we in Minnesota will have a chance to go to the American Dental Association and know something about it.

At the last meeting there were two men from Minnesota at the meeting, I think two from Wisconsin, and three or four from Illinois outside of Chicago. These western States, scarcely representing the west in the meeting at all. But if they bring about the consolidation on the plans proposed, the west will be "in it," so to speak and it seems as if this State ought to send next year some creditable representation to take its part and speak for the society of the State of Minnesota. Certainly the State of Minnesota has enough dentists to have the right to some voice in the formulation of plans for the American Dental Association.

As there are so many other good things in the paper, I will not take up other points that the president has touched upon.

Dr. C. M. BAILEY: Before finally closing the discussion of our president's address, it would seem to me fitting to call more

particular attention of our members to that portion of it that refers to the work of the Dental Protective Association. Only the older among those assembled here can justly appreciate the benefits received from this society, because it is only the oldest practitioners that can remember the Goodyear Dental Vulcantine Company and its illegal and annoying surveillance of the daily practice of dentists, twenty-five and more years ago. The International Tooth Crown Company had placed agents in the different towns and cities of this country, and in this State, among them, who were actively engaged in collecting moneys, and where that could not be obtained, data to be afterward used in the courts for the purpose of forcing moneys from the hands of the practicing dentist. These operations all ceased as soon as this protective association had been formed and its president had notified the International Tooth Crown Company, that he would protect, against their claims, any dentist who was a member of this association. The value of this protection, I think you all are able to judge; for not only have we been unmolested in our work of placing crowns and bridges in the mouths of our patients, but other patentees have left us unmolested in our practice, where their claims have rested upon false or inadequate grounds. The membership fee is \$10 with a possibility of an additional assessment of the same amount some time in the future; there is no doubt but that every man in this room would be paying more than that each year, to the Tooth Crown Company, and although it would undoubtedly be true that you were paying for the protection of some one who, perhaps, was more able but less sensitive to his obligations in this respect; (for the protection is extended to the whole profession and not simply to the members of the association) yet I think your own feeling of self-respect will be greater when you place a crown or bridge for a patient. There are only about 50 members in this State, while there are 350 practicing dentists. I should be glad to send the names of the members assembled here, and so rejoice the heart of Dr. Crouse, who is doing so much for us in this respect.

Dr. H. L. CRUTTENDEN: I am very glad this question has come up for discussion. I think it is a shame that there has been so few backing up this association. I was looking over the list yesterday of the members in this State, and counted fifty-two or three on the list. That is a small number, and it seems a disgrace to the State to have so few. I received a list some time ago but neglected to

bring it with me, but in Dr. Hill's office in Red Wing I saw one posted up and took it and read it over and counted fifty-two or three. There are a number on there not practicing now. At the close of the session in 1888, I think, after we adjourned from the capitol building, I was at the Ryan hotel and heard a gentleman call me by name. He asked if I was from Northfield. He said, "I am manager of the International Tooth Crown Company." I said, of course, "I am very much pleased to meet you." He had been canvassing all the dentists in St. Paul and Minneapolis, and had begun to get some members. I said, "I will talk with you, but I have a friend going to leave on this train and I must go and see him off." I told him I would see him later. He said, "Of course you will come back?" I said, "Oh, yes, I will surely come back." Dr. Lyon kept me in the lower part of the town, so I, unlike the cat, never came back to the hotel again. That was the last I saw of him. I had received several notices, though, and I presume many others have, notifying me that I must stop putting on that work, and that if I did not they would proceed against me. But after this association was formed that was the last we heard from them. Had this association not been formed I think we would have been a good many hundred dollars poorer. I sent my ten dollars, one of the first. I was very much surprised in looking over the list to see some of our leading dentists here had not their names on the list. I think some steps ought to be taken at this meeting. I think they are in negligence. We say we will do it some other time. They are sorely in need of money to carry on suits. They not only protect us in regard to that patent, but in all that may come up. I know that I was interviewed by an agent about a certain spring plate, something he wanted to sell me a license for. I didn't take it out, but wrote and found they would protect me against that patent also. I saved at least forty or fifty dollars by not taking that license.

Dr. C. H. STEARNS: The International Tooth Crown Company has offered to the Dental Protective Association to give each member of that association a license to use all their patents, providing they would pay no attention to any one else—close their books. That would leave the rest of us in a nice little boat. They have either got to do that or have more money. Let us go down into our pockets and furnish the money.

Dr. C. H. ROBINSON: I wish to add my endorsement to what

Dr. Bailey and Dr. Cruttenden have said in regard to the association. I am a member, and personally acquainted with Dr. Crouse. I have heard him from the beginning tell the story of what he proposed to do and was doing, and I thoroughly believe he has used to good advantage and been perfectly honest in administering every cent sent to him for this purpose; and I know he has accomplished grand results. I believe the association has saved dentists in Minnesota and the entire United States hundreds of thousands of dollars.

Dr. F. B. KREMER: I dislike to let an opportunity like this pass without letting my gentle voice be heard in the land. There is a point that I think has not been dwelt upon, that I think would be of vital interest to the rest. They have a great deal of confidence in human nature down there, and will take your note for thirty to sixty days for cash. That is quite an inducement to me sometimes, and perhaps it would be to the rest of you. I have received communications from Dr. Crouse making that suggestion. The association is sadly in need of funds. There are some funds left yet, but they are invested and the association has carried on some portion of its work with the income derived from the investment rather than use the fund itself. If membership is not largely increased soon it will be necessary to use this to carry on the work it has been carrying on in the past. The ten dollars I invested in that six or seven years ago has been the most satisfactory investment I have ever made, and I feel certain that the rest of you owe it not only to yourselves but to the profession and the public in general, to become members; for without the increase soon the organization cannot continue, and if it fails to have the necessary funds the oppression will begin again and we shall all feel the effects of it. I am perfectly willing at any time to go down into my pocket for the next ten dollars I pledged in case it should be demanded, but if you get others to join, it will not be necessary. Whether you do crown and bridge work or not, it protects you in so many different ways, you will be amply repaid for the ten dollars you put in.

Dr. E. B. WEEKS: I feel the way Dr. Kremer does—that I never made a better investment than that ten dollars, and I would at any time gladly go down for the other ten. I feel that the membership in this State is very inadequate in proportion to the number of practitioners we have. I hope more will come into the association.

A CONSERVATIVE ESTIMATE OF THE VALUE OF CATAPHORESIS IN DENTISTRY.

Dr. STEARNS: The doctor spoke of using Willm's current controller; were you able to control the current properly?

Dr. JONES: In the first two cases I reported, I used Willm's controller; and was quite successful. It is not delicate enough for a very sensitive patient. Instruments are provided now that have better control of the current.

QUESTION: How long does the anæsthesia last?

Dr. JONES: It is difficult to tell, usually long enough to prepare the cavity. You can sometimes work two cavities with the same electrode. As to adjusting the rubber dam in using cataphoresis, I was speaking as to its practical utility. There are cases where the rubber dam may be applied in difficult cases, superior or inferior third molars, but the patient would suffer more in the length of time required for the treatment than in having the cavity prepared without it. In the case of the young girl of thirteen, that I mentioned, she endured the rubber dam, but with two applications of twelve minutes each, I could not secure the sufficient amount of current. That means the same thing as Dr. Hartzell means in speaking of amperage; it would be a success no doubt if kept there long enough, thirty minutes or an hour. There are other people whose palates are so sensitive that they will not endure the rubber dam at all. I reported a number of cases, failures, because I wanted to show the different kinds of patients and the different ways it operates upon them and what the effect is.

As to the volt selector, I did not mean that the current was incontinuous; it is continuous. I spoke of an increase by jumps which may be small or large. What would be all right in a good many cases would be too much increase for a sensitive patient of thirteen years. There are instruments, however, now, which mark the increase in smaller gradations.

HINTS FOR A RAINY DAY.

Dr. C. H. STEARNS: I have been interested in this (photographic) work for some time. For making enlargements a very successful plan is—place the negative in a magic lantern, then by using bromide paper get, very easily, an enlargement of any size. Use a white cardboard screen, shut off the light, place the bromide paper in position, turn on the light again and make your exposure. If you want to make a number of copies place your positive in the

lantern, protect that on the wall and take the enlarged negative in the same way. By treating with solutions of paraffine you get your print very nicely—a cheaper arrangement with equally good results.

In regard to making plaster casts, you will have to be very careful about changing position in making your mould or the play of the muscles will change. As a rule, you will destroy your first mould and then make one in a sufficient number of parts to separate. If you wish to duplicate casts, and in particular uneven surfaces (this is specially applicable to large models), use for your mould a composition similar to the printers' roller. It makes a soft, jelly-like composition and takes a clear, accurate copy. In this line, those of you who are amateur photographers and wish to expand your work by using bichromatized gelatine plates (probably you will have to make them yourself), place your plate under the negative, make the print. This prevents the absorption of water by the part acted upon by the light. Let it soak in cold water until the gelatine has swollen all it will, pour in your plaster, and you get a very accurate photographic picture in relief.

Dr. GEO. S. TODD: If I had been given this paper of Dr. Cruttenden's to read and had the moulds before me as illustrating the results he brought, out and then asked to make a guess as to who wrote the paper I should have been up a stump for a while, but my final decision would have been some one just out of college who hadn't any practice yet and had an abundance of time on hand. As it is, I infer that he has a class of patients very neglectful in keeping their appointments. He says that a change often gives him rest. I don't think he often gets tired, because there are a good many changes in the putting in of his time. I am familiar with most of these pastimes he has mentioned, having spent considerable time in his office seeing him work, and being a recent graduate myself, having time on my hands, and I have reproduced a good many of his efforts. He made brief mention of my experiments in trying to take an impression of a boy's face in my office. He got his chum up there one day and took a piece of tissue paper. I thought it was thick enough not to let the plaster go through and went to take it off and it wouldn't come—a good deal the same as Dr. Cruttenden's experience with Dr. L——. The result was that the model had more eyelashes and eyebrows than the subject. After that I used a double thickness of the paper.

In taking the impression of the face I didn't have any quills in my office to place in the nose, so I rolled up some paper and made a tube and I guess I hadn't enough thickness, as the weight of the plaster on the paper closed up the nostril on one side and as the fellow had a bad cold he couldn't breathe.

Dr. F. B. Kremer's clinic reported by Dr. MARK. O. NELSON.

Dr. Kremer demonstrated the principle of construction of a porcelain bridge, and described the process of making it. He had the bridge ready to put on the porcelain body. The bridge extended from the right lower cuspid to the right lower second molar. Platinum caps were made for both cuspid and molar just as we do for the Richmond crowns, and a heavy platinum bar united both abutments. One end bent so as to enter the cuspid root, and the other so as to enter one root of the second molar. This bar was soldered to the caps with pure gold. Just over where the saddle rests, he cut down the model about the thickness of twenty-eight gauge plate. This allows the saddle to rest very tightly on the gums, and prevents the food from collecting under it. The extension bar, saddle and teeth are soldered together with pure gold. This far, Dr. Kremer has made his bridge.

Dr. Kremer uses the close body for extensive bridges. It is a high fusing body, and he thinks it is better adapted for large pieces. The low fusing body he uses for crowns and small bridges. He biscuited the bridge twice this morning. It being extensive and thick it cracked considerable, and will have to receive another biscuit before it is ready for the enamel. Dr. Kremer uses the Custer electric furnace, and it seems to me to be a big improvement in porcelain furnaces. It gives out but very little heat, and can be put in the operating room, needing so little attention that the operator can look after it while working for a patient. It takes fifteen minutes to heat it up to the fusing point the first time, the expansion of the fire clay and the platinum wire being so unequal that the clay would crack and the furnace burn out if it were allowed to run up too fast. After the furnace has once been heated, it can be run up to the fusing point in five minutes. It depends upon the thickness of the body upon how long it takes to fuse. It varies from three minutes in smaller cases to fifteen minutes in full cases. Dr. Kremer will finish the clinic to-morrow.

Dr. A. M. Lewis, of Austin, gave an illustrated talk on his method of making a bicuspid gold crown.

Reported by Dr. M. F. LOWE. The crown was a superior second bicuspid. The principal features were that it could be made rapidly, and be given good articulation. He made the band to correspond in length to the tooth in front. The cusps were made of a solid piece of gold by swaging it in a Mitchell die plate. This solid cap was bent to approximate a "V" shape, in order to elongate the cusps, and make a better occlusion with the lower teeth. The band was also cut out in V shape, as viewed mesio-distally, and trimmed and contoured to receive the bent cap. Filling the band with wax while in position, and securing the cap in the wax, getting correct articulation, he removed them together and soldered. The result was a very pretty crown with proper occlusion. He said this could be done ordinarily in an hour's time.

Dr. F. S. James demonstrated his method of making a porcelain jacket crown.

A platinum cap was fitted over a "peg" lateral incisor, then a very thin porcelain facing fitted to the cap, fastened with porcelain body, the lingual side contoured with the same, and then baked in a Land "midget" furnace. The arranging of undercuts in the cap to help retain the porcelain and other details of the clinic were nicely shown, and the result was a very artistic crown.

A demonstration of bridge work, in which the porcelain teeth are not subjected to the heat of soldering.

By Dr. J. T. DIXON. Plain rubber teeth (bicuspid and molars) were selected for the case. Thin pure gold plate was then cut to pattern for each tooth, and burnished to fit closely around its sides and end, making a cup in which the tooth rested. Each cup was carefully removed from the tooth, and strongly reënforced upon the outside with gold solder. The cups were then assembled, and soldered in proper position in the bridge, after which the teeth were cemented into the cup like depressions before the bridge was placed in position in the mouth.

Dr. C. A. Erdmann gave a very interesting lecture and demonstration of regional anatomy of the head and neck, showing the muscles, nerves and blood supply of the face, mouth and throat.

His lecture was nicely illustrated with manikins and well dissected portions of cadavers.

Dr. W. P. Dickinson exhibited his appliances for making cusps for gold crowns. He uses Melotte's mouldine and fusible

metal, with a set of telescoping rings and other appliances of his own invention.

The doctor also exhibited a beautiful set of nickel-plated model cusps, copied from natural teeth selected very carefully, which enables him to meet the requirements of almost every possible case.

Dr. Norris reported Dr. Hartzell's clinic on bleaching. A central incisor, superior right, with a large mesial cavity. The doctor used sodium peroxide, placing one electrode upon the hand and the other upon the tooth. He used from one to one and a half milliampere strength current. The operation occupied a little over an hour and was wholly successful, but probably would be better under rapid treatment.

Dr. HARTZELL: I want to make clear two or three points in the report. The first thing to be remembered is that the soft tissues must be protected. You must put on the rubber dam. In the second place the current should be even and steady. If discoloration is great and the mass of dentine to be permeated is great, it requires a greater length of time for the current to carry the bleaching agent through.

I believe we might get quicker and better results by placing the positive electrode within the tooth and the negative upon the outside of the tooth, so arranged that the bleaching agent would be carried in the direct line where the decoloration is needed.

Dr. E. B. WEEKS: Explain how you would line the cavity, or fix the bleached tooth before filling.

Dr. HARTZELL: If you use sodium peroxide you must use a neutralizing acid or your patient's tongue will be cauterized. After that use ordinary paraffine, heating the tooth as hot as possible and working the paraffine in with amalgam instruments. It will preserve the tooth better than any other method that I know of at present.

Dr. T. E. Weeks filled a large compound cavity in a superior bicuspid with gold for Dr. F. S. James. The points of special interest being the use of cataphoresis, and the shape given the cavity.

Dr. C. H. Stearns handled the cataphoric outfit, and in twelve minutes with a maximum of twenty volts secured complete anæsthesia.

Dr. Weeks then prepared the cavity, calling attention to the

instruments used, especially to chisels Nos. 47 and 48. The cavity was so shaped as to depend for retention of the filling upon the depressions at the gingivo-lingual and buccal angles and a step or auxiliary cavity in the crown.

Dr. James declared the clinic a great success.

Dr. Weeks also gave a similar clinic yesterday upon Dr. W. D. James with a different cataphoric outfit.

Dr. C. W. Jones gave the cataphoresis part of the clinic. After an hour's effort the tooth was still sensitive, owing, Dr. Jones believes, to secondary dentine and a condition hypersensitive to the electric current.

Amalgam clinic by Dr. E. K. Wedelstaedt, reported by Dr. Geo. E. Means.

It seem to me quite an honor to have had Dr. Wedelstaedt show us the work he did this morning. He evidently made very careful observations—has been associated with Dr. Black, and no doubt gave us a great deal of valuable information. He filled a mesial cavity in an upper right first molar.

The preparation was certainly one of the most beautiful I have ever seen, and different from what I have seen.

He made the undercut near the lingual and buccal angles, and depended for the principal amount of anchorage upon the occlusal surface.

He used Dr. Hewitt's white alloy No. 2—60 parts silver, 30 tin, 2 zinc and 8 copper. His matrix was made of very thin copper and held in place by a ligature tied about the tooth.

The amalgam set very quickly and he was able to finish it perfectly within a few minutes after inserting it.

He used special instruments of his own design, and there were a good many points that set me to thinking.

In future I shall use a great deal more care in my preparation of cavities.

Regulating appliance by Dr. Geo. S. Monson.

The patient was a young lady about sixteen years of age, with protruding superior lateral incisors. The doctor wished to show first what kind of an appliance he would use, and secondly his method of making and fitting the same.

The appliance consisted of a German silver band fitted to each central incisor with a short screw soldered to each band so as to project toward the lips. A strong flat German silver wire was

fitted across the outside of the four incisors so that the ends rested against the protruding laterals. Holes were bored through the wire for the ends of the screws to pass through, and small nuts were placed upon the ends of the screws, so that when tightened the appliance would bring an outward pressure upon the centrals and an inward pressure upon the protruding laterals. There were many little points of interest about the making and fitting of the appliance.

Dr. T. F. WILLIAMS: It looked to me as if the laterals touched the cuspids and overlapped the distal portion of the centrals, and that the centrals needed to be brought forward.

Dr. C. M. BAILEY: I would like to have the *modus operandi* of that appliance working.

Dr. MOMSON: The central incisors were inclined lingually while the laterals were quite prominent, all four teeth were on a line at the lingual border, thus the laterals overlapped the centrals and bound. The cuspids were a little inside of the arch. By increasing the circle of the six anterior teeth, the central and lateral incisors may be drawn into place. This is done by using force and counterforce, *i. e.*, by drawing the centrals out and the laterals down into line by using the kind of appliance that was used in the clinic. The occlusion of the molars and bicuspid was good. If the overlapping of the laterals was much more than it was, it would be necessary to spread the arch and increase the space for the anterior teeth. As it was we could get the space by slightly crowding the teeth.

Dr. Mark O. Nelson showed an original and ingenious method of articulating crowns and bridges.

Dr. T. B. Hartzell performed a surgical operation for cure of large chronic alveolar abscess.

The patient was placed under the influence of an anæsthetic and the doctor made an opening in the region of the incisive fossa. He found considerable destruction of bone, the cavity being about one and one half inches long and involving part of the floor of the nostril. He thoroughly removed all dead bone and packed the cavity with iodoform gauze.

Dr. F. B. KREMER: *Mr. President:* The close of this session marks an era in the life of this society. We have been to many places and have held many meetings, but of all I have attended, this has been the most enjoyable. Our brethren here in Winona

have outdone themselves. They have succeeded in the uttermost in making our meeting both pleasant and profitable. Especially do I wish to thank the press of this city for the courtesy they have shown us. Their treatment of us has been dignified and gentlemanly. Not once have they referred to us in a manner to lessen their dignity or forfeit our respect. All references to our meetings have been conspicuous by the absence of such expressions as "jaw breakers," "molar architects," or other applications of like expressions. Until last year at St. Paul such a condition of affairs could hardly be conceived of. At that time the matter was candidly laid before the managers of the two great dailies by Dr. C. M. Bailey and myself, asking them to accord us at least the same degree of honorable treatment that they would give, unsolicited, to any other convocation of gentlemen in their city. They met us in a kindly and considerate manner, and their references to us were beyond criticism. We believe that this assertion of our professional dignity will, if maintained, result eventually in the greatest good to our profession in the State.

MOUTH WASH.

R	Acid Carbolic Cryst.....	3 ij
	Ol. Cassia.....	min. xx
	Alcohol.....	3 iiij
	Silico-fluorid of Sodium.....	gr. xl
	Distilled water ad q s.....	3 xvj
M.	This may be used full strength or diluted 1 to 3 in water.	

DID IT EVER OCCUR TO YOU that listerine, euthymol, borolyptol, electrozone and pyrozone all had an acid reaction? Hydrozone has a more intense acid reaction than any of the above named agents. Nearly all of the H_2O_2 has an acid reaction.

INFILTRATION ANÆSTHESIA.

The fluid consists of a very dilute solution of cocaine and morphine, with a small portion of chloride of sodium. The needle of the syringe is introduced at a point in the area which it is desired to render anæsthetic, and keeping it parallel with the surface is pushed on until the eye is hidden. A few drops of the fluid are then injected, and a wheal is instantly produced which is anæsthetic. The needle point is then withdrawn and reinserted within the wheal in the line of the proposed incision, and the process continued until the whole area that it is desired to anæsthetize has been rendered insensitive. If the operation be a simple skin incision, as the opening of an abscess, this is all that is necessary; but if a small tumor is to be removed, it will be necessary to infiltrate the tissues under the skin after this has been incised. In minor operations it is very successful. Its safety is beyond question.—*Fife*.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

STATE ORGANIZATIONS.

Within the two or three months from this date nearly if not quite all of the State societies will hold their annual meetings. We urge now that a determined effort be made to enlist the best talent in giving clinics and for the reading of papers.

Do not forget that delegates should be appointed to attend the American Dental Association at Old Point Comfort in August next, when an effort will be made to consolidate or fuse the American and Southern. Will you go to Old Point Comfort and help this movement along?

COLLEGE COMMENCEMENTS.

Very soon two or three thousand aspirants for a place in our ranks will have joined the growing army of dentists in the United States; and if they all come in with learning and enthusiasm, we give them the right hand of fellowship and good will. We are not in need of drones or those of inferior attainments. What is most needed are bright, energetic, study loving, industrious and capable graduates; and we will take them into our societies, consult with them and do all we can to make them efficient in their chosen calling. Welcome to our ranks.

DENTAL LEGISLATION.

If the dentists of the State of Illinois are to have any amendments to the present dental law during this session of the legisla-

ture, it will be necessary to go to work with a will and see that the work is done before the assembly concludes to adjourn. A bill was introduced as early as January 20, but so far nothing has been done with it. The committee having the matter in charge on behalf of the State Dental Society, is composed of Drs. C. R. E. Koch, L. L. Davis and E. K. Blair. Apathy will not win any needed amendments.

PRESS OF MATTER.

In looking over this issue of the DENTAL REVIEW, the reader will notice that a wide range of subjects has been covered in the discussion. As we have much more matter that will prove of interest to the reader, we must defer some editorial expressions until a later issue. We hope to be able to reach some of the deferred papers which have been in our possession for several months.

DOMESTIC CORRESPONDENCE.

ST. LOUIS, MO., January 22, 1897.

EDITOR DENTAL REVIEW :

Dear Sir : It seems to me there is great need of a better nomenclature for orthodontia. In fact the terms at present used to describe the positions of malposed teeth are very clumsy and unscientific, or, as Dr. Black puts it, "mere phrases—nothing else."

As the shapes of the roots, and forms and surfaces of the crowns of the teeth, especially their occlusal surfaces, and the arrangement of their very structure, all point conclusively to the one grand object for which they were designed, namely occlusion for the purpose of cutting and grinding the food to the greatest possible advantage, and as we know occlusion of the teeth is of such vast importance in the treatment of dental irregularities, should we not and can we not name teeth occupying malpositions in the arch, according to their malocclusal positions? For example, mesio-occlusal, disto-occlusal, extra-occlusal, intra-occlusal, torso-occlusal, supra-occlusal and intra-occlusal, and their combinations. It would seem to me such a nomenclature for the teeth occupying malpositions would possess many advantages. First, it would designate their exact locations, and second, the terms would be in harmony with their very object.

I am more and more convinced that occlusion is the very basis of the science of orthodontia, and in proportion as we realize its importance and conform to its requirements in the treatment of cases will we accomplish the greatest good, the most permanent and satisfactory results, and restore harmony, not only to the teeth themselves, but also to the jaws, the muscles and the facial lines.

I would like, if advisable, to use the terms above indicated, or others perhaps more appropriate, but in harmony with and from the basis of occlusion, in my book on orthodontia now undergoing revision.

I would greatly appreciate your views and advice on this question and have also submitted a similar inquiry to others whose judgment I should appreciate.

Yours very truly,

EDWARD H. ANGLE.

REVIEWS AND ABSTRACTS.

A TREATISE ON SURGERY BY AMERICAN AUTHORS FOR STUDENTS AND PRACTITIONERS. Edited by Roswell Park, M. D., two volumes; cloth. Price, \$—, Lea Brothers & Co., Philadelphia. 1896.

We have before us another of the advanced works of the present era of scientific development in pathology and surgery. The indefatigable and accomplished editor, Dr. Roswell Park, of Buffalo, is so well known for his ability and skill as a surgeon that he now adds new laurels to his fame in these large and carefully edited volumes showing his great versatility as an author and writer of some of the most carefully prepared chapters in the system. The illustrations and the text both go to show the pains-taking care of one who thoroughly understands his subject. The chapters on bacteriology and pathology and indeed those on other subjects will, when carefully read, disclose that the authors of all of the chapters are acquainted with the scientific as well as the technical aspects of the subjects treated. The chapter by Dr. A. D. Bevan, on "Surgical Diseases and Injuries of the Mouth, Tongue, Teeth and Jaws" with the appendix by Dr. T. W. Brophy on "Early Operations for closure of Cleft Palate," will, for the use of dentists constitute a safe and useful guide for the large number of operations which they are daily called upon to treat. We have read this

chapter with great personal interest and if we criticised it at all it would be on the line that that portion devoted to alveolar abscesses and the strictly dental diseases might have been submitted to a dental surgeon for elaboration.

The pathology of the blood and the chapter on infection cannot but be read with profit. Regional and general surgery throughout the two volumes is brought to the eye of the reader in such an unmistakable manner that we feel compelled to say that no work of recent years contains so much of general interest as the one under consideration. The errors, if there are any, we have failed to notice. The books are well bound and of convenient size, and are indexed so that no time is lost in consulting them.

PAMPHLETS RECEIVED.

Proceedings of the National Association of Dental Faculties. Thirteenth Annual Meeting, Saratoga, N. Y., 1896, with the constitution and codified rules. Louis Ottofy, secretary; J. P. Gray, president.

MEMORANDA.

Aristol is composed of iodine and thymol.

Dr. G. C. Brown, of New Jersey, is deceased.

Dr. J. A. Robinson, of Jackson, Mich., is dead.

The Ohio Dental Journal issued an electrical number for February.

The British Medical Association will meet in Montreal in August.

Dr. J. S. Wood, the inventor of Wood's metal, died recently in Oak Park, Ill.

The Southern Dental Journal and Luminary is now published as a quarterly.

The *American Medico-Surgical Bulletin* is now one of our most valued exchanges.

Dr. E. Magitot has been reelected president of the Society of Stomatology, Paris, France.

Dr. Henry Hartshorne, the editor of Hartshorne's *Conspectus of Medical Science* for many years, is dead.

The Detroit College of Medicine and Dentistry now occupies suitable quarters since the disastrous fire in December.

Seventeenth annual banquet Central Dental Association of Northern New Jersey was held Monday evening, February 15, 1897, at Newark, N. J.

A Fellowship Club (dental) has been organized in Streator. Very shortly small societies will be holding meetings in Elgin, Aurora, Joliet, Rockford, Michigan City, Ind., St. Joseph, Mich., and Milwaukee, Wis.

The two latest additions to the dental colleges of the United States are the following: Dental Department of the College of Physicians and Surgeons, Dr. Winslow Anderson, Dean, 603 Sutter St., San Francisco, Cal. Miami Dental College, Dr. P. C. Layne, Dean, 625 W. Ninth St., Cincinnati, O.

The regular monthly meeting of the Hayden Dental Society of Chicago, was held at the residence of Dr. Harper, Thirty-fifth St. and Wabash Ave., on Monday evening, February 15. Dr. A. C. Halphide read a paper on "Hypnotism," and gave some practical demonstrations of the hypnotic power. The subject was generally discussed.

TO ABORT CORYZA.

- R Phenic acid, pure,
 Spirits of ammonia.....āā 5 gm
 Alcohol at 90 per cent..... 10 gm
 Distilled water..... 15 gm
 S. Gtt. x on blotting paper to inhale every hour.—*Lermoyez.*

STATE BOARD OF DENTAL EXAMINERS OF ILLINOIS.

The Illinois State Board of Dental Examiners will meet Monday, March 29, 1897, at Chicago for the purpose of examining candidates and transacting other business. All persons intending to appear before the board at that time should notify the secretary not later than March 15.

L. L. DAVIS, *Secretary*,
 1303 Columbus Memorial Building.

THE CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the annual meeting, held the 15th of February, the following officers were elected for 1897-98: President, Wm. L. Fish, D. D. S., Newark; Vice President, Fedsall Riley, D. D. S., Newark; Treasurer, Chas. A. Meeker, D. D. S., Newark; Secretary, Herbert S. Sutphen, D. D. S., Newark; Executive Committee—Geo. E. Adams, D. D. S., South Orange; W. E. Truex, D. D. S., Freeholdt, C. S. Hardy, D. D. S., Summit; F. S. Gregory, D. D. S., Newark; Fred C. Barlow, D. D. S., Chairman, Jersey City. H. S. SUTPHEN, D. D. S., Sec'y.

SECTION II. DENTAL EDUCATIONAL LITERATURE AND NOMENCLATURE, AMERICAN DENTAL ASSOCIATION.

Dear Doctor:—The members of this Section request that you prepare a paper for the meeting of the American Dental Association to be held at Old Point Comfort, Va., August 2, 1897. It is the desire also that you report any work done under the above head in your State or local societies.

S. H. GUILFORD, *Secretary*,

LOUIS OTTOFY, *Chairman*, 1628 Chestnut Street, Philadelphia.
 Masonic Temple, Chicago.

TOOTH DRAWING—ITS HORRORS AMELIORATED SOMEWHAT BY THE USE OF ELECTRICITY.

If you like you can now have a tooth pulled painlessly and without gasby

electricity. Instantaneous? Why, of course, but the point is that there is no pain. You need not bother with nitrous-oxide gas, which is very distressing in its effects upon some people, says the *Cincinnati Enquirer*.

The up to date dentist has a very simple apparatus, which consists most importantly of a battery not much bigger than a cigar box. The person in the dentist's chair grasps two handles which are connected with the battery by wires. At the same time the operator seized his forceps, which likewise are on the end of a wire proceeding from the battery. He touches the tooth, completing the circuit, and instantly a local anæsthesia is produced. The tooth and neighboring gum are rendered for the moment insensible to pain, and out comes the offending molar or incisor with dexterous twist. Before the patient has had time to realize what has happened he is gleefully paying the fee.

PRELIMINARY PROGRAM ILLINOIS STATE DENTAL SOCIETY.

President's Address. Dr. C. R. Taylor.

Report of the Committee on Dental Science and Literature. Dr. A. W. Harlan.

Report of the Committee on Dental Art and Invention. Dr. J. E. Keefe.

Pyorrhœa Alveolaris. Dr. J. W. Wassall. Discussion to be opened by Dr. A. W. Harlan.

Classification of Cavities and Rules Governing their Preparation. Dr. W. E. Harper.

Dr. E. H. Allen. Subject to be announced.

Diffusibility of Coagulants in Dentine. Dr. E. Lawley York.

How shall we best Insert a Gold Filling? Dr. Arthur G. Smith. Discussion opened by Dr. C. N. Johnson.

Dr. C. S. Case. Subject to be announced.

Be a—Man. Dr. A. H. Peck.

Anchoring Large Contour Fillings in Incisors. Dr. L. W. Skidmore.

Report of the Supervisor of Clinics. Dr. T. W. Pritchett.

February 1, 1897.

TO THE EDITOR OF THE DENTAL REVIEW:

My Dear Doctor: Somebody, either the writer, the postman or the typo, evidently got very badly mixed up, in the article on Roentgen rays, in your January issue.

The description is very clear, but the illustration evidently belongs to some other case.

In the first place, the case refers to the left side—the illustration depicts the right.

Again, by the aid of the Roentgen ray, merely a shadow is obtained, and such a picture, or sciagraph, bears no resemblance to a photograph; your illustration is a regular reproduction of a cast; a sciagraph of such case would present the roots and crowns in faint outlines, no gum, shadings on the centrals, and distinctly marked cusps of bicuspid, as shown, would be discernible.

Furthermore, no case, in which the point of the cuspid overlapped the crowns of the lateral and central, as shown, would require any X ray to reveal said cuspid, surely.

So much for the case as shown.

Now, a word as to the method suggested to any of your readers, who may desire to try this method of diagnosis.

Glass plates, 5 x 1 inch, are advised, and wrapped in black paper, and in case the paper becomes wet during the sitting, the process to be stopped, a new wrapper put on, and the plate replaced in position.

Now I wish Brother Catching would just tell us how he gets the plate back in identically the same position it was in before removal, for if it is changed a hair's breadth of course the picture would be ruined.

Yours truly,

C. EDMUND KELLS, JR.

QUESTIONS SUBMITTED FOR DISCUSSION BY LOCAL SOCIETIES.—FORMULATED BY THE COMMITTEE APPOINTED BY THE AMERICAN DENTAL ASSOCIATION.

1. Pyorrhœa alveolaris; what is it and how many varieties are there? Are all local in origin or constitutional, or both? What is the treatment, local or constitutional, or both? What may be regarded as a cure? Is the disease likely to recur?

2. *a.* What is the cause of dental caries? *b.* Why is caries so much more active in some mouths than in others? *c.* What changes take place where caries ceases its activity in mouths heretofore predisposed? *d.* Are there recognizable signs by which we may know whether or not caries will cease with advancing age?

3. To what extent are we justified in giving our patients systemic treatment?

4. To what extent and when are we justified in using cataphoresis? Is there danger of injuring the dental pulp or other tissues by its use?

5. What can we do to increase the attendance at our dental societies?

6. In view of the recent investigations has amalgam been a blessing or a curse to humanity?

7. Are there any proofs that the mercury in amalgam fillings is injurious to the health of the patient?

8. What are the best materials for filling teeth and the prospective durability of fillings in different cases?

9. What are the best methods of bleaching teeth?

J. N. CROUSE,	} Committee.
L. P. BETHEL,	
A. W. HARLAN,	

XII INTERNATIONAL MEDICAL CONGRESS, MOSCOW, AUGUST 19-26, 1896.—SECTION OF DENTISTRY.

Dear Sir and Colleague :—The organizing committee of the section of dentistry of the XII. International Medical Congress in Moscow, have the honor to send to you herewith the regulation of the congress, together with the program of the mentioned section, and to respectfully solicit your assistance in insuring the section's success by your presence here and by a report upon one of the questions in the said program.

On accordance with the seventeenth paragraph of the regulation, papers dealing with the subjects named in the program, will have preference over others. This does not, of course, exclude communications upon other subjects, but such communications can only be read provided that time permits. We would therefore venture to suggest that, if possible, the subject of your paper should

be chosen from the enclosed list. We feel sure, however, that even should you elect to make a communication upon some question, not mentioned in the program, an opportunity will undoubtedly be found to enable you to read it.

Should you wish to make a report it is very important to receive same, or, at any rate, a short account of it before May 1, 1897, for printing and distribution among the members of the congress.

Trusting to hear favorably from you, we remain, dear sir and colleague,

Yours faithfully,

DR. F. REIN, *Manager of the Section.*

DR. I. KOWARSKY,
DR. N. NESMEJANOW, } *Committee.*
DR. S. URENIUS,

The address of the manager: Dr. F. REIN, Moscow, Little Dmitrowka, h. Scheschkow.

The program of the occupations of the section of dentistry of the XII. International Medical Congress at Moscow:

1. What kind of general and special learning is desirable for the persons who are to occupy themselves with dentistry? The lecturer, Prof. Dr. Julius Scheff, Vienna.

2. The hygiene of the cavity of the mouth and of the teeth.

3. General and local anæsthetics for tooth extraction. The lecturer, Dr. V. Richardson, London.

4. Cataphoresis in dentistry.

5. The essence and treatment of the pyorrhœa alveolaris. The lecturer, Prof. Dr. József Arkövy, Budapest.

6. The treatment and filling of the pulpless teeth.

7. Crown and bridge work from the hygienic and technical point. The lecturer, M. Morgenstern, Baden-Baden.

AN EASY METHOD OF TAKING PLASTER CASTS.

The foot, for example, having been lightly smeared with vaseline, is quickly bandaged with an ordinary muslin and plaster of Paris bandage about two inches in width, which has been soaked in a hot solution of alum and water, in order to make it set quickly. The bandage must be squeezed as dry as possible before it is applied. The toes and heel are, of course, taken in, and the bandage is continued as far up the calf as is thought necessary. Not more than three thicknesses of bandage need cover any part. By a little careful squeezing, the bandage is pressed into the crevices between the toes, and, to strengthen the mould without making it more difficult to slit down, a little dry plaster of Paris is rubbed over the surface, avoiding the part where it is intended to cut down the mould. While the plaster is still moist, it is cut with a pair of scissors along the outer side of the leg and foot as far as the little toe, so that the mould can be easily drawn off the foot. The cut edges of the mould are at once approximated and fixed with strips of Mead's sticking plaster. The mould is then set aside until it is thoroughly hardened; then it is oiled inside and filled with plaster of Paris and water mixed to such a consistency that it will run into all crevices of the mould. When it has quite set, the strips of Mead's sticking plaster are removed and the mould is peeled away from the cast.—ALAN MACKAY, *Intercolonial Medical Journal of Australasia*, September.

THE DENTAL REVIEW.

VOL. XI.

CHICAGO, APRIL 15, 1897.

No. 4

ORIGINAL COMMUNICATIONS.

NUMERICAL VARIATIONS IN THE MOLAR TEETH OF FIFTEEN NEW GUINEA CRANIA.

BY GEORGE A. DORSEY, PH. D., ASSISTANT CURATOR OF ANTHROPOLOGY, FIELD
COLUMBIAN MUSEUM, CHICAGO, ILL.

While examining, recently, a series of Papuan skulls I was surprised to find the range of variation in the molar teeth to be so great. It is not often that within the compass of a small collection of crania from a single locality one sees so beautifully illustrated the now common enough observation that in the course of man's phylogenetic development he has already lost one or more pairs of teeth, and is about to lose one more. To be more exact, there are in the series three examples of suppressed third molars, and two examples of a supernumerary molar. Without entering into a discussion as to the morphological signification of anomalous condition of this sort, I shall simply record the facts as they exist. Those who are interested in a discussion of the signification of such observations as I shall have to record, will find the whole matter of numerical anomalies in the teeth summed up in a brief and admirable manner in Weidersheim's *Structure of Man*, pp. 156-161.

The collection of crania under consideration was purchased from a trader who brought them from New Guinea, where they had graced the home of a native chief, who prized them as trophies of victims slain in war. They are of more than usual interest because the frontal bone of each skull is ornamented by incised carvings of a symbolical character, and the lower jaw is held in place by a band passing through the nares and around the sym-

physis, and by other bands which pass through a hole in the ramus just beneath the sigmoid notch and are fastened to the zygomatic arches. There are sixteen crania in the collection, but as one is that of a child of nine years, and so must be excluded from numeration, we have for our consideration fifteen crania.

It is a remarkable fact that, so far as I can see, there is not an unsound or diseased tooth in the entire series; nor, with but two exceptions, is there a single case where a tooth has been lost and the alveolus absorbed. In the first exception, the lower jaw has been fractured, and as a result the alveoli of two molars were destroyed; in the second case, the molars of one side are gone, the alveoli absorbed, and the maxillary sinus laid open in three places. It is also worthy of note that in no skull was the wear of the teeth enough to amount to anything. In one case only could the degree of wear be said to be that of No. 2 of Broca's scale.

While the fact that the lower jaws are firmly held in place by bandages is of great interest and ethnological value, it must be regretted that this condition prevents any careful study of the variations in the hard palate. Such a study, made in connection with the loss or increase of one or more teeth would undoubtedly be of interest as well as of importance. The same cause also prevents, in three cases out of five, any observations on the numerical variations of the cusps of the teeth. So much for the teeth in general; now for those which directly concern us. We shall consider first the examples of

SUPPRESSED MOLARS.

No. 40,618.—Skull of an adult male: The first thing that strikes one on taking up this skull is that it is too light, too smooth and too small to be that of a male; but, on the other hand, a closer and more careful inspection seems to convince one that it is entirely too heavy, too rough and too large to be the skull of a female. And so, without any very serious questioning, I have considered it as a male skull.

The upper left incisors and canine have been lost; their alveoli are perfect. The teeth present are sound and healthy. The jaws are markedly prognathic, and do not seem unusually short. In this skull both upper and lower third molars are entirely suppressed.

No. 40,607.—Whatever slight doubt there might have been in

regard to the sex of the skull just described, there can be none here, for it is a typical skull of an adult female.

There are two very striking features about this skull, apart from any consideration concerning the teeth. The first is the extreme prognathism of the entire face, and especially of the alveolar arches; and, secondly, the very weak mental development of the lower jaw. The upper left third molar (see Fig. 1) is present, but is crowded backward and upward until it almost rests on the alveolar arch just behind the last lower molar. In life it must have pressed heavily on the gum. The remaining

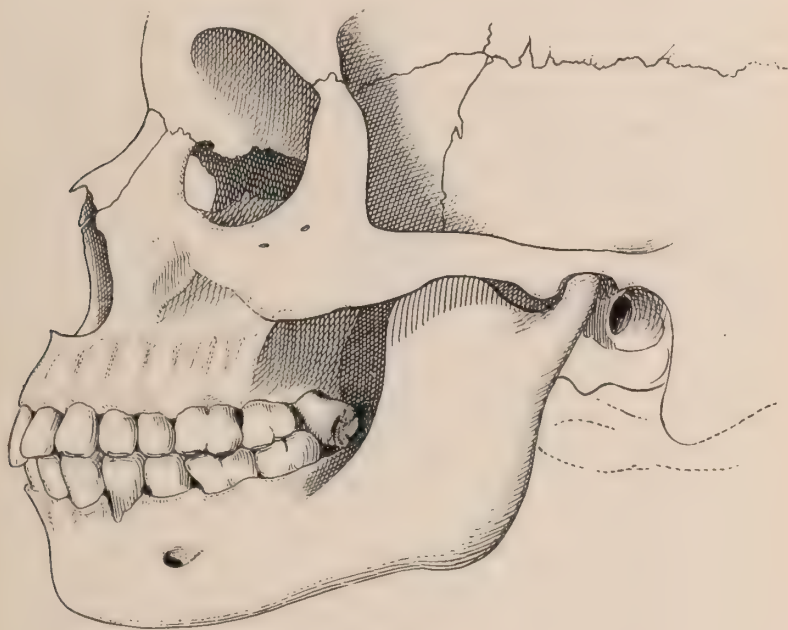


FIG. 1.

No. 40607.—Lateral view of face of Papuan cranium, with suppressed lower third molar and malposed upper third molar. (One-half natural size.)

three third molars are suppressed. All the other teeth are present and in perfect condition.

No. 40,620.—Skull of an adult male, of slightly advanced age. Only the following teeth are *in situ*: upper right canine, left canine and second premolar, and lower right second and third molars and left first and second molars. These teeth are some-

what worn. None of the alveoli of the other teeth are closed. The upper third molar on each side is entirely suppressed.

Reference has already been made to the lower jaw of this skull. It may not be without some interest to record its condition a little more fully. The right body shows very plainly the lines of union of an old fracture which evidently extended through the bone and involved the alveoli of the second premolar and the first molar. At this point exists a deep circular excavation which extends down into the jaw for more than half its normal depth, and gives rise to a rounded eminence on its inferior surface.

SUPERNUMERARY MOLARS.

No. 40,614.—Skull of an adult male, of large capacity and good development. Only the lower molars and upper first molars, right canine and first premolar are *in situ*. The remaining alveoli are all open and in healthy condition; many of them, however, contain tooth-like plugs of wood, put in after death for adornment.

As the lower jaw of this skull is detachable, it is possible to examine in some detail the cusps of the teeth. The upper first molars, the only ones present, have each five cusps, the extra cusp being situated just posterior and a little to the labial side of the oblique ridge which connects the anterior lingual with the posterior labial cusp. The second molars have only two fangs, and these are merely indicated in the alveolus by a slight median ridge on its posterior surface. The cusps in the lower molars are normal; *i. e.*, the first has five, the second and third, four each.

The supernumerary pre-molar (see Fig. 2) occurs in the lower jaw on the right side, opposite to the interval between the first and second premolars, on the lingual side. Just the crown of the tooth is visible and during life it evidently had scarcely begun to enter the gum. The crown is 7 mm. long and 5 mm. in its antero-posterior diameter. The tooth is bicuspidate and, so far as the crown is concerned, does not differ from the ordinary bicuspidate tooth.

No. 40,611.—Skull of an adult female. In many respects, so far as its general character goes, it does not differ materially from number 40,607, which has already been described. The decided alveolar prognathism is very striking. In this skull also, very fortunately, the lower jaw can be detached without injury to the bandages, and we can study the hard palate as well as the teeth. The palate is remarkable for its great depth in proportion to the

general size of the face; it measures more than 15 mm. in several places. There is a well defined *torus palatinus*, and the transverse palatine suture is not straight, but irregularly oblique on each side, owing to the encroachment, along the median line, of the palatine plates on the maxillary bones. Both of these conditions are more often associated with the dark races than with the white, and are the usual condition in some of the anthropoid apes.

The upper right mesial incisor, left incisors and canine, and the lower left lateral incisor, canine and first premolar teeth have been lost; their alveoli are perfect. The other teeth are all present and in sound, healthy condition. The most striking feature in re-

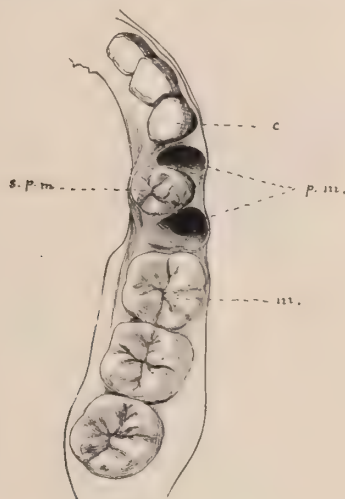


FIG. 2.

No. 40614.—Left half of lower jaw of a Papuan, with partially erupted supernumerary premolar tooth. (One-half natural size.)

c., plug of wood in canine alveolus; p. m. alveoli of premolars; m., first molar; s. p. m., supernumerary premolar.

gard to the teeth present, and one which is apparent at even a superficial glance, is their very large size. This may best be shown by reference to the *dental index* of Flower. The dental length (the distance from the anterior surface of the first premolar to the posterior surface of the third molar of the upper jaw), is 46 mm.; the basi-nasal length (the distance from the median anterior

border of the foramen magnum to the naso-frontal suture) is 94 mm. From these we obtain the dental index by this formula:

$$\frac{\text{dental length} \times 100}{\text{basi-nasal length}}$$

which in this case is 48.9; the average for both sexes in the Papuans being 44.2, and in Europeans, 41.3.

The first upper molars have five cusps, the second molars four, and the third molars five, a very unusual condition.

It is also to be noted that the third molar is distinctively larger than the second, and fully as large as, if not a trifle larger than, the first molar; this is true of the right side only. Of the lower molars, the first and third have five cusps, or the usual num-

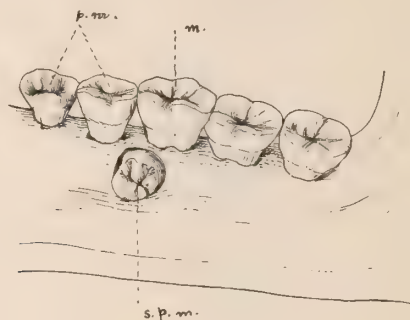


FIG. 3.

No. 40611.—Internal lateral view of right side of lower jaw of a Papuan, with partially erupted supernumerary molar tooth. (Natural size.)

p. m., premolars; m., first molar; s. p. m., supernumerary premolar.

ber; the second has only four, or one less than the usual number.

The supernumerary tooth (see Fig. 3) is situated in the lower jaw, on the right side, between and internal to the second premolar and the first molar. The root of the tooth seems to lie nearer that of the molar than that of the premolar. The crown is directed considerably inward and slightly forward. In character it approximates the first premolar rather than the second, in that the lingual cusp is much smaller than the labial, and furthermore it does not possess that quadrate form which is so characteristic of the second lower premolar. As may be seen in the figure, the crown has barely cleared itself of the alveolus, and it is not likely that it had as yet made its way through the gum. Only the superior and a

very slight portion of its anterior surface is visible. The crown measures 8 mm. in length and 7 mm. in its antero-posterior diameter.

SUMMARY.

No. 40,618.—Male skull, with upper and lower third molars suppressed.

No. 40,607.—Female skull, with one upper and both lower third molars suppressed.

No. 40,620.—Male skull, with upper third molars suppressed.

No. 40,614.—Male skull, with supernumerary lower left premolar.

No. 40,611.—Female skull, with supernumerary lower right premolar.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

(CONTINUED FROM PAGE 206.)

Dr. J. D. Patterson of Kansas City, Mo., read a paper entitled, "Peculiar Pathological Perceptions." (See page 111.)

DISCUSSION ON DR. PATTERSON'S PAPER.

Dr. JOHN S. MARSHALL: *Mr. President, ladies and gentlemen:* I have had an opportunity this afternoon to hastily read this paper, and had I had this opportunity a week ago, so as to have had time to have written an answer to it, I should have been most happy to do so. But with the hurried reading of the paper I do not feel that I can take up the question as it deserves to be taken up, and answer *seriatim* the propositions that have been made. I do not know how I can better discuss the paper than by reading to you extracts from a paper which I wrote and read on this subject before the American Medical Association, at Washington, on May 5, 1891.

[Dr. Marshall then read the following extracts from the paper mentioned:]

Clinical and post-mortem experience teaches that the *materies morbi* of these diseases has a predilection for the fibrous structures of the body, especially the synovial membranes, the aponeuroses of muscles, the dura mater, the cardiac tissues, periosteal and periodental membranes. The one most commonly affected is the

synovial membrane, resulting in inflammatory conditions of the joints.

The predisposing and exciting causes of certain irritative conditions of the pericementum seem to have their origin in the same conditions which bring about the phenomena of gout and rheumatism, and they have also proved by experience to be amenable, in many cases, to the same specific treatment adopted in these diseases. This last fact has lead me to the belief that the rheumatic poison is largely accountable for many of the diseased conditions of the pericementum, and has induced me for several years to make close and careful observation in relation to the prevalence of irritation of the pericementum in gouty and rheumatic individuals.

This belief has been further strengthened by finding, upon analyzing the urine of a number of persons suffering from peridental irritation of this character, that there was a considerable excess of uric acid in every case. The saliva also, in many cases, gives a decided acid reaction.

The peridental membrane seems to be very susceptible to the irritating effects of an acid condition of the blood, whether from an excess of lactic or uric acids retained in the system, or from the ingestion of such acids as are found in sour wines and malt liquors.

The habitual use of sour wines and malt liquors often results in peridental irritation of a marked character, in individuals who have never developed symptoms of a rheumatic condition; while, on the other hand, the same irritative conditions are found in total abstainers; but these, it would seem, are due to rheumatic phenomena, and are often the forerunners of an approaching attack of acute articular inflammation.

Congestion and thickening of the peridental membrane and temporary loosening of the teeth, accompanied with dull, gnawing pains and more or less soreness, are a common occurrence in rheumatism and gout. At times this condition is the first definite symptom to be manifested of an approaching attack of acute articular inflammation, while in others it does not make its appearance until after the first acute symptom has subsided, and occasionally it is the only manifestation of this peculiar diathesis.

The presence of concretions upon the roots of the teeth is the most common cause of inflammation of the pericementum, and it

has been generally supposed that these concretions were formed from the saliva.

It is my purpose to call attention to what seems to me to be a more rational explanation of the formation of these deposits in locations where the saliva could not, or could with great difficulty, reach. The saliva contains as waste products a certain amount of phosphate and carbonate of calcium which has been rendered soluble by the action of carbonic acid. A certain amount of ammonia is given off from the lungs as a product of combustion of tissue; while fermentation of alimentary debris lodged about the teeth also furnishes an additional amount of ammonia. This ammonia coming in contact with the saliva in the mouth, unites with a portion of the carbonic acid to form carbonate of ammonia, thus liberating a portion of the calcium which is thrown down in the form of a precipitate and lodges upon the exposed surface of the teeth. But when deposits occur at remote points from the gum margin, it does not seem possible that this is the correct explanation of their presence in these locations. The law of gravity carries all bodies that are heavier than the medium in which they are suspended, downward; consequently we must look for some other explanation for the presence of the deposits on the roots of the superior teeth.

Capillary attraction may possibly account for their location, but this seems hardly probable, for it presupposes the presence of a pocket, or a separation of the pericementum from the cementum, while the amount of saliva entering such an existing cul de sac, would be extremely small, and not likely to be changed at sufficiently frequent intervals to account for the rapid accumulation which takes place in some of these cases. We are forced, therefore, to the supposition that they are deposited from some other source, and under an entirely different group of circumstances.

It has been suggested by Dr. Ingersoll, of Keokuk, Iowa, that these conditions were a direct deposition from the *liquor sanguinis* which bathes the roots of the teeth during the suppurative stage of the inflammatory process. This may be the correct solution. It is true that calcareous material is sometimes deposited from pus, in proof of which might be mentioned the fact that the roots of dead teeth penetrating the antrum of Highmore and foreign bodies located in this sinus during suppurative inflammation, have been found when removed to be covered with calcareous deposits, but that this is a common occurrence in suppurative conditions in

any locality, admits of serious question. I am of the opinion, however, that the deposition of the concretions upon the roots of the teeth in those localities not readily reached by the saliva, or in which the presence of the saliva would be an impossibility, are due to the causes which produce the chalky formations found in the joints and fibrous tissues of gouty and rheumatic individuals.

The thought has occurred to me, though I have not had time to demonstrate it positively, that the concretions found upon the roots of the teeth in the locations just named were masses of urate of soda with phosphate and carbonate of calcium, and that they are deposited directly from the blood, as is often the case in rheumatic arthritis.

Furthermore, it would seem that these concretions were the cause of the inflammatory condition, rather than the result of it. In proof of this let me state that clinical observation teaches that suppuration often occurs about the roots of the teeth at remote points from the gum margin, and which have no outlet until the pericementum is dissected from the roots of the teeth by the accumulation of the pus. I have seen cases in the upper jaw in which an abscess had been formed upon the roots of living teeth, between the neck and the apex, and in which the attachment of the gum at the neck of the tooth was intact and the pus did not escape until nature had perforated the soft tissue, or relief was given by the use of the knife. In such cases I have never failed to find concretions upon the root at the point of suppuration; this could not possibly have been deposited from the saliva, and it is fair to presume that the deposit upon the root was the source of irritation that produced the abscess, rather than that the inflammatory condition was produced by some remote cause and the formation of the deposit the result of the inflammation.

Phagedenic pericementitis is sometimes directly traceable to a rheumatic condition of the system or the uric acid diathesis. In several cases in which I have analyzed the urine, uric acid was found largely in excess of the normal quantity. During an acute attack of gout the quantity eliminated is greatly decreased and is stored up in the liver and the spleen.

In all of the cases which I class as rheumatic, concretions are found upon the roots of the teeth, and many times in locations which preclude the possibility of a salivary origin.

Under restricted diet, in which meats, wine and malt liquors

are cut off, there is soon a marked diminution of the quantity of uric acid excreted, and an equally marked improvement takes place in the symptoms manifested in the oral cavity, which cannot be accounted for by the removal of the concretions and local treatment alone. In one case which has been under observation for four years, the periodical aggravation of the oral symptoms are a sure indication of the presence of an excessive amount of uric acid in the urine, and as soon as this condition is corrected the inflammatory conditions of the pericementum are greatly relieved. Local treatment is necessary, but this alone is not sufficient; we must strike deeper and correct the morbid condition of the system if we hope to effect a cure.

Dr. Patterson sums up his paper with three conclusions. *First*, he says, in gout, authorities differ as to whether the deposits follow or precede the inflammatory action. It must be granted that they do differ. So do authorities as to the origin of carcinoma and of the cause of suppuration even. They differ as to the causes of dental caries; and so we find an indefinite number of pathologic conditions upon which we do not agree as to their real or primary cause. But this does not prove that the gentlemen who maintain the uric acid theory of the disease are wrong, neither does it prove that those who take the opposite view are right.

In his *second* proposition he says that the vascular tissues, such as the pericementum, are not subject to the gouty deposit. Just let me read two or three paragraphs here from the work of Sir Dyce Duckworth. He is, I believe, the best English authority on gout. He says: "The disease is either inherited or newly acquired. In most of its manifestations it is plainly associated with perturbed relations of uric acid in the economy, and the inflammatory attacks are accompanied by deposits of urate of sodium, for the most part in articular cartilages and fibrous structures."

Speaking of the synovia he says, "the synovia often contain specks of urates and may be unduly vascular. I have met with speculae of urates on the synovial fringes. Deposits may be found in every component tissue of a joint, and are met with in connective tissue, intermuscular connective tissue, in the nerve sheaths, periosteum, prevertebral fascia, tendons and their sheaths, ligaments and in fibro-cartilage." The structure of the periosteum and the peridental membrane are very nearly alike; at any rate, so far as their vascularity is concerned, and both are fibrous structures.

Third, that the dense anatomical structures of the parts about the roots of the tooth do not afford the necessary bursa or the necessary character of tissue in which gouty deposits appear, unless previous lesion has caused such space. I did not know it was necessary to have a space in order to have deposits take place. I do not think there is space preformed in the pulp of a tooth where the secondary dentine is being laid down over the point of contact from the caries, neither do I think there has been a preformed space in the pulp itself when pulp stones are formed there, nor in the periosteum or bone when the nodular enlargements are formed upon the surfaces of the bone. I may be all wrong in this, but I believe the space is made by absorption as the concretions are laid down or as the hypertrophic tissue is formed, as in the case of the nodular enlargements upon the surfaces of bone.

In the latter part of his paper the doctor would convey the idea that there must have been some sort of an antecedent injury. I do not know but that is correct. I do not know but a good many of these cases may be the result of inflammatory conditions which have preceded the attack. I would not dare say dogmatically that these deposits are laid down first and then the inflammation follows it, and that the deposits are the cause of the inflammation; I have not been able to prove that yet; I do not know that any one has been able to prove it, but still that is my opinion. I think that it is true, but what I think and what I am able to prove are two very different things.

Now, it seems to me that the best argument we have that these conditions are many times—I do not say always—due to a gouty diathesis is the results which are obtained from constitutional treatment. We know that in a case of syphilis, if we apply the specific remedy we obtain relief by improved conditions in a certain number of days or weeks; for instance, take a syphilitic swelling, or ulceration: by the use of mercury or of the iodide of potassium we can very soon reduce the inflammatory swelling or heal the ulcer, and the other symptoms will disappear. Just so in the treatment of gout; these paroxysms of gout can be shortened, and the periods between them greatly lengthened by a restricted diet and the use of proper solvents. I could show you cases, some of them under treatment for years, who are comparatively comfortable just so long as they follow the gouty regime. These are principally men that I have ref-

erence to now. The diet is restricted by cutting off all red meats, wine, fermented liquors, and malt liquors. By such a regime they do not have the same degree of discomfort that they have when they indulge in these things. I have frequently said to several of these men when they have come to consult me, and I found three or four teeth, that had perhaps been perfectly comfortable twelve hours before, suddenly attacked with pericemental inflammation, teeth so sore that the mouth could not be closed, "What have you been doing; have you been to a banquet?" "Yes; three or four days ago I was at a banquet." "Did you eat a game dinner?" "Yes." "Did you drink champagne?" "Yes."

I have admonished some of my patients year after year, until I have prevailed upon some of them not to indulge in these things, and as a result the paroxysms are much less frequent than when they used to indulge in them. That is one of the evidences, it seems to me, that the condition many times is a gouty one. I would not say that local treatment must not be employed; that would be foolish. Local treatment must go with the constitutional treatment. To attempt to cure one of these cases without removing the concretions would be folly. It could not be done, but both combined will, in many cases, gradually relieve the conditions and make the patient comfortable. I dare not tell you that I cure my patients. I have seen a few cases which I hoped were cured, and they have gone sometimes three or four years without recurrence and then have come back to me. There are some men who will tell you that they can cure these cases. I do not claim that. I claim to relieve my patients and make them comfortable, and that is all I can say.

One other point referred to in the paper. The doctor, if I understood him rightly, does not believe that these pockets are ever formed about the roots of teeth without being connected in some way with the mouth through the margin of the gum.

Dr. PATTERSON: I did not say that.

Dr. MARSHALL: But we find such statements in the journals. In a great many cases such communications do exist between the abscess and the mouth at the neck of the tooth; but in a great many others they do not, at least this has been my experience, and I do not believe that I am a careless observer, or that I make my examinations in a slipshod or hasty manner.

One other point, and I am done. Dr. Patterson spoke of co-

agulation necrosis as though it occurred in the blood current. Perhaps I misunderstood him. Coagulation necrosis occurs in thrombosis and embolism, in the inflammatory exudates—liquor sanguinis and leucocytes—and in diphtheritic exudations by the formation of fibrin. Coagulation necrosis may also follow stasis caused by inflammation. Coagulation is the result of a peculiar ferment, known as fibrinogen, acting upon the fibrinoplastin, and forming what is known as fibrin. The fibrinogen and the fibrinoplastin are both supplied from the leucocytes as they are dissolved in the liquor sanguinis.

Another form of coagulation necrosis is known as necrobiosis. This condition is a death of individual cells—a molecular death of tissue, and is generally confined to limited areas of tissue. Coagulation takes place also in this form of necrosis as in the other, and as the cells die they coalesce and form firm, solid masses. Nature disposes of this form of dead tissue in three ways—by absorption, by fatty degeneration, or by suppuration.

Dr. G. V. BLACK: I notice in reading extracts relating to deposits in gout, that these deposits are always in the tissues, at least in all cases spoken of, and so far as I know, pathologists do not speak of gouty deposits upon bones or, as we have, deposits on the roots of teeth. It is true that we do have lateral abscesses on the roots of teeth that apparently are not connected with the gingival margin by an opening, and the pulp of the teeth still living. I say apparently are not connected, but the gentlemen must remember that there is a series of glands in the peridental membrane, the pericemental glands running very deep in the membrane from the gingival margin, and that so far as pathological determinations have ever been made, and they have been very imperfect, it appears that this disorder is propagated along the lines of these glands and it is through this that these foci are connected with the gingival margin.

Now, there is no doubt but that these deposits are serumal deposits. I might have brought some specimens of deposits on the ends of roots where the saliva could not have been. I might have brought some tools that had been lodged in the flesh that have these deposits upon them, hard substances, uncovered bones or roots of teeth denuded of their membrane, or hard foreign substances lodged in the flesh have these deposits upon them. Whether they be within the alveolus or whether they be elsewhere,

they are not necessarily deposits of urates. They may contain urates, and generally do, in small amounts, very small amounts usually. There is this thing that is apparent in all the discussions upon this subject, we have not studied the histological character of this membrane sufficiently, neither have we made pathological studies that are at all sufficient for the determination of this subject. Now, I commend you, gentlemen, to a study of the histological character of the membrane and after having learned the histological character of it, make a pathological study of this disease along the regular lines of pathological work. I have wished that I could do it, but I have not had the time and opportunity to do so. It is a difficult thing, because of the difficulty of obtaining subjects. We cannot kill these patients and get their jaws, but I do hope that some of you who are living in the cities and associated with medical schools, and with hospitals where it is possible to obtain these things, will make these studies. Until we can make these studies we may talk and talk and talk, and we will still only be guessing.

Dr. CRAVENS, of Indianapolis, Ind.: Dr. Marshall's remarks called to my mind the history of scurvy during the war. I was informed once that there was an outbreak of scurvy quite manifest in the army; they had this soreness and loosening of the teeth; they had the swollen, bleeding gums, all the symptoms you might perhaps say of *pyorrhœa alveolaris*. It did not come from high living either. There was no catawba or claret, but it manifested itself for five or six months. They did not have any red beef of any kind; they did not have a mouthful of vinegar; they could not get a sour taste of anything. But this disease manifested itself, and it was called scurvy by the doctors, and it disappeared or was modified as soon as the supplies came to them, so that they had plenty of beef, red and otherwise; the beef was on its legs when it got to them, and they had plenty of vinegar, and it was always worse when they had nothing but the salt bacon or salt pork.

Furthermore, I have had two patients, gentlemen, about sixty years of age, who were prisoners in the Libby. They did not get any red beef; there was not much red beef inside the line of Richmond at that time, as I understand; they did not get any vinegar; they had an inordinate desire for something acid, and the scurvy was noticeably bad in all those prisons where they had very little to eat, and had nothing green, nothing red, nothing sour, so that it

seems to me if high living is necessary to develop gout, the soldier managed to get pyorrhœa alveolaris by a different process.

Another point occurred to me in Dr. Marshall's remarks. He stated, if I understood him correctly in the discussion of another paper, that disease was not transmitted.

Dr. MARSHALL: Tuberculosis.

Dr. CRAVENS: Disease, and to-night he read from an English authority, and the very first statement that that authority made was that gout was inherited. I do not believe that gout has anything particularly to do with it, unless perhaps it might make the individual more uncomfortable and a little more difficult to treat, because he has a weakened condition and could not well submit to an operation. I have found people who have had the gout; I know one man over sixty years of age who has gout, and very badly; I know another very near the same age who has gout, and those patients are as amenable to treatment as any I have ever had. I do not believe that a gouty diathesis cuts any figure whatever in the cause or continuance, or in rendering pyorrhœa alveolaris incurable.

Dr. BROPHY: I have listened with a great deal of interest to this discussion regarding pyorrhœa alveolaris. I would like to know if it would be out of order for us to ask some of these distinguished gentlemen to tell us what they are going to do with it, how they are going to treat it. We boys here want to know something about that.

Dr. MARSHALL: I just want to set myself right. Dr. Cravens stated that I said disease was not inherited. I said nothing of the kind. I was talking about tuberculosis, and I said it was not inherited, that the tendency or predisposition to it was inherited; and I maintain that position. Furthermore Dr. Cravens has been talking of scurvy and not upon the subject of the paper.

Dr. J. N. CROUSE: I would like to have one question settled and that is, if the gentlemen here do not believe it is gout, or caused by uric acid, will they please tell us what it is. That is what I want to know. If I think uric acid is an exciting cause and you give me a better theory, I will drop it in a minute. I am of the opinion that there are three or four phases of the disease, and if there is anybody who has any doubt about the sanguinary deposits forming on the roots of teeth without any abrasion, I think I can produce a patient to-morrow where an abscess finally

formed and I opened it and removed the deposit as well as I could. Two of the teeth I was obliged to remove with the forceps, and on removal found a pus sac right in the middle of three roots. The roots seemed to be in perfect condition, and I never pulled harder on a tooth in my life to get it out. I would not have taken it out if I could have gotten rid of the patient without. He was bound to have it out; was suffering with pain almost unendurable.

My attention was called to this condition of pyorrhœa twenty-five years ago, when a big, vigorous man who indulged in a good deal of beer and a good deal of profanity was attacked with an upper first molar. He came to my office at night and asked me to take the tooth out. It was perfectly sound, but I found that at the end of the root there was a calcareous deposit. I took out four molar teeth for that man inside of a year, and each one had that kind of deposit near the end of the roots. That man is living in Chicago to-day, and has had no further trouble with the rest of his teeth.

There was a part of Dr. Patterson's paper which was not touched upon, the one where he describes the disturbance of the peridental membrane by food and consequent loss of the tooth by disease of the socket from that cause. It is evident that it is some form of trouble of the peridental membrane. Now, then, the gentlemen who do not like the gout, let us have something else. I have very gouty patients who have pyorrhœa and I have some that are not gouty who have pyorrhœa. We do have deposits of some kind in gout. I have got it myself. If I get overworked or I get very tired I feel my gout; when I rest and behave myself and take plenty of nourishing food, it passes off. I think the history of cases as observed, in the worst cases of pyorrhœa, is that they never get absolutely well. I never feel safe in saying to a patient, you will have no more trouble. Every time they get overworked, very tired, they will come back again. I have a patient who was a prosecuting attorney at one time and he prosecuted the anarchists and during that time I took care of his teeth evenings. Every time that man gets overworked he comes in and says, "Well, doctor, the thing is up again and you will have to give me some treatment."

I dismissed one patient of whom I had gotten very tired. This patient was a woman and she had not taken any intoxicating

liquor either, but she was an infernal crank who tormented me every time she came into the office and I got tired of her and proposed that if she would hunt up another dentist I would give him the full history of the treatment. She left the office; she did not go to anybody else and about two years later she came back to me and she said "Are you still mad at me?" I said "No, I was not mad at you, I thought you were mad at me. I never get mad at anybody, I let the other fellow get mad." To my utter amazement those teeth were nearly all in very much better condition than when I took care of them and I thought it was necessary to treat them every few weeks.

Now, I only speak of this case because, it seems to me, we might draw a lesson from this one case. These cases that will not get well, send them off and let them go without treatment for a while and see if they do not get better.

Dr. PATTERSON: Commencing with the last speaker, there is only one thing that struck me about the molar; when the gum is intact and apparently the pulp is all right, why did you not find out positively that it was all right?

Dr. CROUSE: I would have had to determine it with a microscope.

Dr. PATTERSON: You will understand perfectly that in my paper I admit that there can be those deposits and that there are those deposits from pericementitis, and that makes a persistent lesion. There may be a traumatic injury from which we have pericementitis, and then there is the persistent injury and then the space for deposits. I do not say that there must be a solution of the gum margin.

Dr. Marshall and others in discussing this question seemed quite alarmed in regard to where these deposits came from if they are not from the blood current. This has been made clear very often; I have done it myself eight, nine and ten years ago. I have given testimony after testimony from the best authorities which say that wherever there is a suppurative process there is always a calcareous deposit in a convenient territory, and Dr. Counselman says the deposit may occur in all tissues of the body of man. I said that eight years ago at the Louisville meeting.

In that connection some have asked for the etiology. We have not been talking about the etiology of pyorrhœa alveolaris to-night. I think I have done my part in so far as perhaps my

misunderstanding of the case may admit; and I have always treated of the etiology, trying to prove that it was a catarrhal condition, very much the same as catarrh, not a disease *per se*. Dr. Marshall says that usually we find the calcareous matter in the suppurative products. I say that authorities say we always find it. I can give any amount of authorities to that effect.

The best argument Dr. Marshall advances is that upon giving the medicines for a gouty diathesis. Lithia water, or whatever he gives, improvement is noticeable in cases of pyorrhœa. Whether pyorrhœa is from gout or not, any medicines of that kind will restore health, tone up the system. A man who is suffering, complains. If he drinks freely of mineral waters, if he has constipation it will cure that and gout, and then he will get better naturally on account of the fact that he has gout and that the medicine improved the gouty condition. It seems to me that is very reasonable.

In quoting from Duckworth, it is true that the periosteum is one of the places which is given in gout as the seat of deposits. One of the places, so he says, but I want to point you to the fact that the periosteum between the pericementum that we have upon the root of the tooth is vastly different from the periosteum that is found on one side of the deposit of tissue entirely, and the other on the outside of the bone. He spoke about the deposit in the pulp tissue; there was no cavity, no bursa, no place for the deposit. I beg his pardon, there was the soft tissue. It is not in the joint, it is not in the synovial fluid, it is in the cartilages; and when we have deposits in the pulp we have the territory for that. Besides, we know where those pulp stones come from, and there is opportunity there for deposits.

Somebody said that when some of his patients went to a banquet, pyorrhœa got worse. Probably their heads got worse, too. That don't prove anything. Any diseased condition of the body will be aggravated by dissipation. When the body is run down there is lack of nutrition, there is this waste; and when any dissipation is indulged in, the afflicted part of the body will cry out.

I am very glad the discussion has taken so wide a range. What I have said I thoroughly believe. I do not desire to antagonize anybody else's grounded belief in statements, but simply to give my own and try to give my reasons for them.

CHICAGO DENTAL SOCIETY.

Report of Clinics, at the thirty-third annual meeting, held February 1 and 2, 1897:

CLINIC NO. 1

MESIO-OCCLUSAL AMALGAM FILLING, AND DEMONSTRATION OF THE USE OF CAVITY MEASURERS OR INSTRUMENTS FOR MEASURING CAVITIES. BY DR. E. K. WEDELSTAEDT, ST. PAUL, MINN.

You can readily see, gentlemen, what this case is—a mesio-occlusal cavity in an upper right first molar. My clinic calls for an amalgam filling, demonstrating the use of dentometers or instruments for measuring cavities.

You can note the occlusion. Any filling will have to stand the stress from this lower molar. How much is this stress?

Let us take the gnatho-dynamometer and see what it registers. The young man bites but 125 pounds. Well, that is very little; some are able to bite much more. He says he is "afraid to bite more." Let us, before we put on the rubber dam, measure the crown of this tooth.

The length of the crown from the gum line to the end of the mesio-buccal cusp is 7.3 millimeters; its width at the gingivæ (mesio-distally) is 10.7 millimeters; the thickness at the gingivæ (linguo-buccally) is 12.4 millimeters; the thickness at the middle of the tooth (linguo-buccally) between the gingivæ and the occlusal is the same. You will observe, gentlemen, that the crown of the tooth is nearly square.

If any one wishes to hear more as regards the measurement of the crown of this tooth I will be glad to explain before I put on the rubber dam. Questions were asked and answered, and a short talk given on the system of measurement.

Now we have the rubber dam on this case. We will prepare this cavity on the principles established and advocated by Dr. Black in 1891.

The cavity was prepared on these lines, the anchorage being at right angles to the proximal portion of the cavity. Now the cavity has been cut sufficiently broad, so in the excursions of the food the margins will be kept clean and in good condition. The tendency will be to constantly polish them. You will observe the margins are slightly beveled, not alone the proximal walls, but the

occlusal walls also. The anchorage is in the central pit occlusally. Let us first measure it, or we can first measure the entire cavity, and then consider it later.

	MILLIMETERS
The width of the cavity, linguo-bucco-gingivally.....	5.9½
The width linguo-bucco-occlusally.....	7.2
The width of the seat from the axial angles to the margins of the cavity.....	1.6
The width of the step linguo-bucally.....	5 3
The width of the anchorage linguo-bucally.....	4 7½
The length of the step mesio-distally.....	3.7½
The entire depth of the cavity from the bucco-occlusal en- amel to the seat.....	3.9
The depth of the step apico-occlusally.....	2.5
The depth of the cavity below the step.....	2.8
The depth of the anchorage apico-occlusally	3 2

These measurements do not differ very much from my recorded measurements of these cavities, of which I have quite a number. It is not, however, my intention to speak of measurements of cavities beyond this case. I would like very much to interest you in the usefulness of cavity measurements, and such as care to hear more of it I will be very pleased to talk with on completion of the filling.

You will observe the seat is broad and flat enough for any filling to rest well. The general form and shape of the cavity is such that there is no question as regards the stability of any filling that may be placed within its walls. The anchorage is sufficient also, and there is not any chance for a movement of the filling from the stress of mastication.

I desire particularly to call your attention to the form of this step; it differs most materially from the usual form, it being broader where it joins with the proximal portion of the cavity. This is something entirely new, and is of importance, for it adds greatly to the strength of any filling that may be placed within these walls.

This particular form of step has not been advocated before, and I am very pleased to call your attention to it. I have been compelled to adopt it in many cases, for the simple reason that the old form has not been sufficiently strong; fillings have frequently broken at the junction of the step with the proximal portion of the cavity. I think the danger is greatly minimized where more strength is added to the filling at that point.

This cavity is entirely prepared now, and you are all welcome to examine it, and I will cheerfully listen to the criticisms that you may have to make.

As you are all satisfied, presumably at least, I will say it is necessary in these mesio-occlusal amalgam fillings, if one wishes to expedite the operation, to use a matrix. This one is of thin annealed copper, one-twentieth of a millimeter thick. I do not know that it makes any difference what the thickness of the matrix is at any time. I prefer, however, the thinnest I can obtain for the great majority of cases. It is easier for me to contour an amalgam filling with a thin than a thick matrix. I will simply tie this one around the tooth in the usual way with which you are all familiar.

Now, we are ready for the amalgam. I will use what is known as a quick setting amalgam, and courtesy demands that all questions be asked before or after the operation of filling this tooth, as after I commence to mix the alloy with mercury it is necessary to work rapidly, and I will be grateful to all if you will kindly assist me in this.

What is that question? "How long will it take me to pack the amalgam into the cavity?" Well, I do not know, but here is a stop watch; time me. I desire, however, before I commence to mix this alloy, to call your attention to these amalgam pluggers. I will use the largest serrated amalgam pluggers that will go into this cavity. It does not make any difference in the strength of the filling whether smooth or serrated points are used. It does, however, make the greatest difference what the diameter is of the points. These on the table vary in size from 1.5 millimeters to 3 millimeters.

The reason for advising the use of as large an amalgam plugger as would conveniently go into the cavity is this: I was anxious to know what, if any difference there was, in the strength and flow from the same mix of amalgam where two points of different diameters were used in two fillings of known size. The first point was 1.2 millimeters in diameter. Three pieces of amalgam were used to fill the cavity; ten blows on each piece; strength of each blow, two pounds and eleven ounces. The size of the second point was 2.4 millimeters in diameter. Amalgam from first mix was used, and the method governing the first filling was used for the second. The difference in the result on testing these fillings was so great that I would not believe it, and the experiment was repeated again and

again without practically any variation in the original result. In speaking later with Dr. Black as regards this, he said he had gotten similar results in similar experiments.

We will now mix our alloy and fill this cavity. The amalgam was mixed in the palm of the hand, any surplus mercury was expressed by placing the mass into a napkin and wringing it. Hand pressure was used for packing the amalgam. Time occupied in filling the cavity, one minute. In two minutes and ten seconds the matrix was removed and the filling was found to be sufficiently hard to trim with instruments having a cutting edge. I do not know that it makes any difference, but I believe, gentlemen, that a quick-setting amalgam is what all of us, or the great majority, will in the future use for these large proximal fillings. There is not any danger in breaking down your filling in the removal of your matrix, or from the occlusion of the teeth as so many of us have experienced in the past.

I desire to thank you, gentlemen, for your assistance and your suggestions in this operation.

CLINIC NO. 2.

ORAL SURGERY CLINIC. BY JOHN S. MARSHALL, M. D.

Dr. Marshall exhibited at his clinic a patient from whom he had removed, one year ago, a large myeloid sarcoma of the right superior maxilla, extending from the cuspid tooth to the tuberosity of the jaw, and involving the entire floor of the antrum. Photomicrographs of the structure were shown (see page 269), proving the character of the growth. This was the third operation, but up to the present time there had been no evidences of a recurrence. One of the most interesting features of the case was the almost complete closure of the immense opening into the mouth by healthy granulation, so that at the present time there only remains an opening the size of an ordinary netting needle.

The photograph of the case upon which Dr. Marshall had operated for infra-orbital neuralgia by resection of the nerve, after the manner of the Tillaux operation, was exhibited to show the difference in the scar left by this operation and that of Lucke's operation, as modified by Lossen and Braun, which had been made by another surgeon upon this patient, one year before. In the operation made by Dr. Marshall, an inch of the nerve was removed from the infraorbital canal. (P. 268).

He also described a case of infantile scorbutus scurvy, which

he had hoped to present, but which for some reason had failed to be present. The case was interesting from the fact that such cases are exceedingly rare. The child was eight months old, but very small for its age. Six teeth had erupted—the four incisors above, and the central below. These teeth were nearly buried out of



FIG. 1.

sight in masses of swollen and hæmorrhagic gum tissue. Upon an examination of the body of the child, the ankles and knees were found to be swollen, and several hæmorrhagic spots (purpura hæmorrhagica) were found upon the wrists, the thighs near the inner side of the knees, and upon the abdomen—eight in all. The bowels were inclined to be loose, and the appetite not good, food often

being refused. These conditions had been present some three or four weeks. The case was evidently one of scorbutus, due to malnutrition.

Several minor cases for operation were presented from the college clinic; one a case of impacted lower third molar, which was removed under cocaine injection (eight minims of a 4 per cent solution). The shape of the tooth (see page 270) prevented its removal except by the extraction of the second molar.

The second case was one presenting alveolar abscess of the lower maxilla, with an external sinus associated with the left first

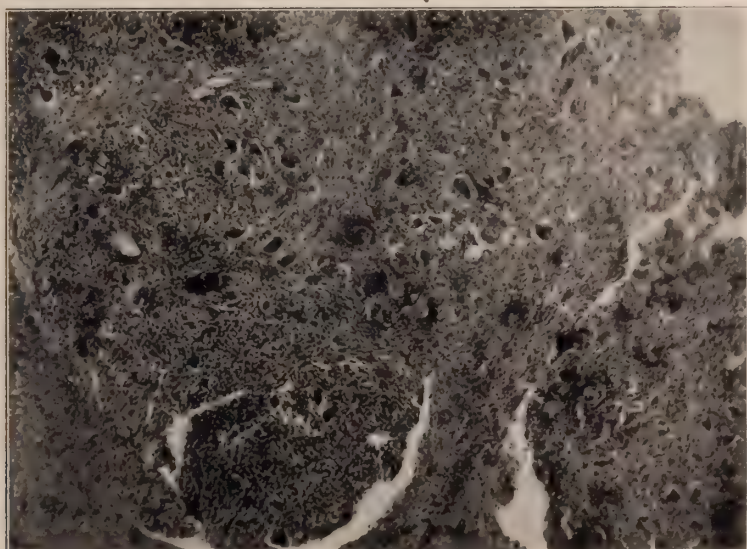


FIG. 2.

molar. The external sinus had been discharging for two or three years.

The case was treated by the extraction of the tooth and irrigation of the abscess cavity and sinus.

A third case was one of cyst of the upper maxilla, of inflammatory origin, and dependent upon the left first bicuspid which had been devitalized for many months. The cyst was large, causing bulging of the palate process. Puncture with the exploring needle revealed the tumor to be filled with straw colored serum. Cocaine was injected, and the tooth extracted. The cyst was then explored with a probe, when it was found that it had extended for-

ward to the lateral incisor. This tooth had also lost its vitality, and as the root seemed to be involved in the cyst, it was extracted. On irrigating the cavity of the cyst, through the alveolus of the bicuspid, the solution flowed through the alveolus of the lateral incisor, thus establishing the fact that both teeth were involved in the development of the cyst. The treatment consisted of curetting the cavity of the cyst, irrigating with boric acid solution, and packing with borated gauze. The dressings to be changed morning and evening until granulations had filled the cavity.

The last case was that of a young lady with the superior *frænum labiorum* attached to the border of the gum between the cen-



FIG. 3.

tral incisors, and the lip turned down so closely that it was impossible to raise its central portion. The treatment was as follows: The patient was anæsthetized, the *frænum* dissected from the gums with scissors, and the edges of the wound in the mucous membrane of the lip brought together with silk sutures.

CLINIC NO. 3.

METHOD OF STARTING A FILLING OUTSIDE OF THE CAVITY WITH THE AID OF MATRICES. BY DR. S. H. GUILFORD, OF PHILADELPHIA.

This method applies only to approximo-occlusal cavities in bicuspid and molars, and consists essentially of wedging and retaining the first pieces of gold between the matrix and the cervical margin of the cavity.

The detail is as follows: The cavity is prepared in the usual way except that the buccal and lingual walls need not be given any retentive form. The cervical wall also is not grooved, but is flat; its surface being at right angles to the long axis of the tooth. No starting pits are required. When the cavity has been pre-

pared a band matrix is placed around the tooth and tightened by the clamp and key. The matrix will not hug the tooth tightly at the cervical portion next to the cavity. Instead of bringing this portion of the matrix in contact with the tooth by means of a wedge, as is commonly done, the slight space existing is utilized in holding the first pieces of gold introduced.

In starting the filling, a mass of gold in the form of a soft cylinder or rope, somewhat longer than the lateral depth of the cavity, is carried end foremost and wedged between the matrix and the cavity at its cervical wall. The cylinder or rope is then bent over the margin and pressed down upon the cervical wall. A second and third piece is then introduced in the same way, and the whole malleted firmly into place, after which the filling is continued and completed in the customary way.

By this method the first pieces of gold are held immovable by being clamped between the matrix and tooth; the cervical wall is sure to be covered and protected, while at the same time it is not weakened by grooves or starting pits.

After the filling has been completed and the matrix removed, the excess of gold protruding from the cavity at the cervical margin is trimmed off with a small scalpel and the surface properly smoothed and polished.

Dr. G. devised this method some fifteen years ago, and has constantly utilized it in his practice since with the most satisfactory results. The method was illustrated by means of large plaster models of teeth with cavities in them and correspondingly large matrices and clamps. Rolls of yellow tissue paper served in place of gold, and they were introduced by means of enlarged instruments. A natural tooth, partly filled and surrounded by a matrix and clamp of usual size, was also shown to help illustrate the procedure.

CLINIC NO. 4.

A METHOD OF MOUNTING GOLD CUSPS ON BROKEN DOWN BICUSPIDS AND MOLARS. BY DR. B. J. CIGRAND, CHICAGO.

This method is found advantageous in badly decayed bicuspids and molars when dentists are tempted to position "all-gold or telescope crowns." It not infrequently happens that the outer surfaces, save the occlusal, are in perfect condition; and the proper restoration of the occlusal surface would suggest a large gold filling, but on account of both the great difficulty of insertion and the

tediousness of the operation, it has been my experience of late to resort to a process which yields better results than the telescope crown, and fairly rivals the permanency and practicability of the mammoth gold filling. The production of proper occluding cusps on a filling of this character will completely test the ingenuity and patience of any operator; while by the method here proposed the work is materially simplified without detracting of durability or usefulness. The method in question is this: Place the dam in position; cut out the decayed contents of the cavity, shape it as for an Ottolengui gold filling and insert a filling made of an alloy of silver and platinum; permit the filling to set, after which grind or trim off the entire occlusive surface to a point corresponding to the cusp margin. Then with the aid of the Hollingsworth cusp buttons proceed to select a cusp which will in shape and size completely restore the portion of the tooth cut down. After selecting the latter with reference to the natural occlusion, proceed in the usual manner to swage the complemental cusp; trim off the overhanging portions of gold and solder the cusp to a small piece of plate gold. This gives you a swaged cusp thoroughly sealed at the cusp border and answers the same purpose as a solid gold cusp. Next use a trephine such as is generally employed in cases of implantation, and cut a circular opening into the trimmed or occlusal surface of the tooth; fit into this opening a complementary band of the same width as the depth of the circular opening; paint the exposed edge of the band with rouge, then place upon the occlusal surface of the tooth the swaged cusp—the rouge will mark the line of contact between the latter and the band. Remove the cusp and extract the band and reposition the band on the cusp at the point indicated by the rouge; with binding wire hold the entirety intact and with a sparing amount of solder fasten the band to the cusp. Now anchor the golden cope with a combination of cement and gutta-percha, and after these materials have sufficiently hardened proceed to polish the joint margins with cuttle-fish disk and whitening.

CLINIC NO. 5.

CRESCENT CROWN. BY DR. W. G. WENDEL, OF MILWAUKEE.

The crescent crown is similar in construction to the so-called Richmond crown, with the exception of the ferrule. In its place was a piece of gold to form a two-thirds band.

Prepare root in the ordinary manner, and adjust a platinum

pin accurately in the root canal; make a cap of platinum to cover surface of root; then drive pin through the cap; remove the cap and pin and solder; replace cap and pin; then fit your crescent band on the lingual surface; then take an impression (modeling compound) of crescent cap and pin; grind tooth to fit the cast, same as for Richmond crown.

There are certain advantages to be derived from this crown, viz : it does not impinge upon the gum at the labial surface and leaves a clear line of continuity between crown and root. Its strength is almost equal to the Richmond crown, and much superior in appearance. It is only applicable to the anterior teeth.

CLINIC NO. 6.

GOLD FILLING. BY DR. E. H. ALLEN, FREEPORT, ILL.

Patient was Dr. D. M. Cattell, of Chicago. Operation was gold filling in sup. right first molar, mesio-occlusal surface. There being not sufficient separation, more space was obtained by the use of an Ivory double bow separator.

Cataphoresis was used and so far as anæsthesia was concerned, it was all that could be desired; but the electric current was unsteady, causing thereby shock of more or less severity. Had the current been supplied by battery instead of the 110-volt direct or light and power current this unpleasant feature of the clinic would have been avoided. The cavity was quite large but excavated without pain to the patient. To guard against thermal changes as much as possible as much cement as could be used was placed in the floor of the cavity.

Retaining grooves were made to retain the filling with the idea in view to secure the best anchorage with the least loss of strength and durability.

The cavity was filled with Ney's gold No. 4, four sheets placed one upon another and folded to No. 64 and cut into ribbons. Each ribbon of gold was annealed as used. The Bonwill mechanical mallet was used throughout the entire filling, making, as I believe, a thoroughly condensed and durable filling. Sufficient contour was made so that when the teeth returned to their normal position after the filling was polished and complete, there was to be no space at or near the occlusal surface. Examination the next day showed that the filling had been sufficiently contoured and that no space was left and that the margin fillings were free from contact in every particular.

CLINIC NO. 7.

VARIOUS CLINICS AND EXHIBITS. BY DR. W. G. A. BONWILL, OF PHILADELPHIA, PA.*

1. *The Many Uses of Gutta-percha in Dental Practice.*—How he makes use of it as a matrix in filling with gold, and also amalgam. As an immediate stopping in nearly every case of caries without first cutting out but a trifle of decay, first saturating the decomposed dentine with carbolic acid and placing a piece of blotting paper in direct contact with dentine, soaked in the acid and allowing to remain from two weeks to six months, or a year before thoroughly excavating.

This not only makes the operation of excavating comparatively painless, but has checked further decay, and no danger of pulp becoming exposed from the decay, and when the gutta-percha is stuffed in between the teeth and carried over onto the grinding surfaces without dividing the filling at the proximal line it is the best means of separating the teeth by the pressure used in masticating.

Its use in temporary teeth almost exclusively, and after very little excavating.

Its advantage in giving assurance and confidence to patients.

Gives you time to wait to see what will be the issue of its presence in the cavities of decay.

How it enables one to postpone for months and have patient in ease and fearing nothing.

Avoids the use of rubber dam temporary and permanently, can be done instantaneously, and no risk in having a pulp exposed from delay of weeks where much is to be done.

By filling all the cavities on all sides at once, when they are masticated upon, the teeth rearrange themselves, and you have again normal articulation.

When the surfaces are wide enough apart then three or four adjoining cavities can be thoroughly prepared, and all of them filled at one sitting, and no dam.

It enables you to have the teeth so wide apart that we have plus contours, and the gum is allowed to once more attach itself to the alveolar process, and obviates largely future recurrence of decay.

* Upon request Dr. Bonwill kindly prepared this report in advance, but was unavoidably prevented from being present.

As a permanent ^{*}stopping on all surfaces where there is but little attrition, nothing is better and less likely to give annoyance and result in death of pulp.

As an assistant in correction of irregularities. As a flat surface stopping in superior incisors where it does not show.

As a certain means of retaining artificial crowns, that are at any time easily removed. Never cover it up in a pulpless tooth with amalgam. It discolours it, and the edges are acted upon so that it deteriorates and makes it of no value.

Can be used as a filling on the surface of a tooth in conjunction with gold or amalgam, and remain good.

Can be placed into cavities on proximal surfaces while wet, and will prevent future caries.

Have seen many cases where the gutta-percha was bobbing around in the cavity, and no further decay occur, particularly in temporary teeth.

As an assistant in holding up the dam where one cavity is under the gum by pressing it up, carrying the dam before it, and the adjoining cavity, retaining the dam and gutta-percha when cold. To assist in holding firmly weak teeth when pressing or hammering in the filling. To place in a proximal cavity, and make a matrix of it; to commence an adjoining gold filling where no points can be made at the cervix for retainers.

There are so many other applications of this pink base plate gutta-percha that the ingenuity of the operator will see at a glance when once he has seen what it has done for him in the practice of true, conservative saving of tooth structure.

2. *Clinic on Abbey's soft gold foil (old-fashioned).*—Its great value as the softest working of all others, and how oval faced pluggers will pack it solidly, the same as the adhesive or cohesive gold.

How a few degrees of heat will make immense difference in the plastic qualities of it.

Dr. Bonwill intends to show that age in gold foils has nothing to do with the adaptability and working qualities of it.

That it has no superior or equal, and, when once the secret is known how to handle it, then no other gold foil will be needed in one's practice. It possesses all the qualities that any skillful dentist requires in the beautiful art of saving human teeth from further destruction.

That Abbey's cohesive foil, when once smooth oval pluggers are understood, and used in a power mallet, like the mechanical mallet, will prove all that is needed, without looking to any further make of gold. It will show and convince that there are too many styles of gold in the market, and demonstrates that when the proper means are used for packing gold, the failure will be found to have been in the operator; hence Abbey's soft or cohesive foils, No. 5 soft, Nos. 10 and 20 cohesive.

It will be shown how amalgam can be packed under saliva, blood, or in water, and still be made water tight, in the mouth, or out of it.

How smooth faced pluggers alone should be used in the working of amalgam.

That age has no effect on the working qualities of amalgam.

That the alloy should be in finest chips, and not in filings, to make it amalgamate at once with the mercury, and that as little as possible should be used in the mix.

That when Japanese bibulous paper has been pressed and rubbed upon each piece while packing until the whole is filled, and then the dry chips should be rubbed on to the surface until they become amalgamated and adhere to the mass, and no free mercury is found on the surface and around next the walls of the tooth. No need of using gold foil or pure tin; use only the thin chips of the same amalgam, and when the matrix can be used the results are marvelous, as Charles Tomes of London, says: "There is no other method to approach it."

3. *Clinic, Showing in his own mouth two Cases of his Method of Clasp ing Teeth.*—This is for sections of one or more instead of mutilating human teeth to place on permanent gold caps or crowns, and is quite applicable everywhere.

4. *Clinic in his own Mouth of the Use of Gutta-percha.*—Used as a wedge and a protection from future decay and to gain a plus condition for contouring and saving tooth structure.

5. *Pointed Fissure Burs.*—These obviate the use of files in trimming the ever changing edges of either gold or amalgam at the cervical borders, and for making permanent separations in the incisors, from the palatine side only, or are equally applicable for the bicuspid and molars in either jaw for removing of superficial decay and destroying all capillary surfaces and making them easier of self-cleansing. Their use in the removal of amalgam surplus

after hardening at the cervix is of itself enough to commend them to the attention of all.

They save oceans of time and so painless, while beyond all other instruments most efficient.

6. *Exhibit of New Hand Piece.*—This is a combination of mallet in the same instrument; and a new arrangement of the dental and surgical engine simplifying and making it far more effective and universal and cheaper and less subject to change or needing of repairs.

Also in clinic a right angle attachment to the Bonwill mechanical mallet for filling on distal surfaces, making as effective a blow as if struck in a direct line with the shaft.

7. A toothbrush was to be exhibited to show how small and yet more efficient, and no wear or tear upon the gums or teeth.

Several other things were to be shown such as the anatomical articulator for setting artificial teeth from one to a full set and for the better understanding of all cases of irregularity before any steps are taken to correct them. It teaches what is true anatomy and mechanical science, and what and how to do it by absolute law, and enables the operator to study the cases at his leisure in the absence of the patient.

In cases of pyorrhœa it solves a problem hitherto overlooked, that of taking into consideration the undue pressure on the affected teeth, which rearticulating is three-fourths the battle and without which no cure can be effected by any treatment. Its laws show how necessary is the study of the laws of human articulation by this instrument in order that the dentist or physician can treat any deviation from normal structural shape or deformities. Its application is boundless in opening up new fields for investigation and widening the scope of the dentist in every line of his work and finally showing that it demonstrates what was the structure of the front human jaw and that it has never changed for the better but always retrogrades save in the sizes and shapes of the teeth.

CLINIC NO. 8.

DANGER OF COMMERCIAL CURRENTS IN CATAPHORESIS. BY DR. L. E. CUSTER, DAYTON, OHIO.

Dr. Custer demonstrated the possible dangers from the use of the commercial 110-volt current. A ground was made on a steam

radiator, and it was shown that there would be from 50 to 70 volts sent through the patient if such connections should be made. The second demonstration showed that there would be an increase of about a volt if the patient should touch the iron work of the chair, which has a fountain cuspidor attached to it, the ground being through the water flowing in the rubber tubing. The third demonstration showed that there would be a variation of about one volt if a dental motor should be thrown in or out during the application of cataphoresis.

CLINIC NO. 9.

INCISOR CORNER OF PLATINIZED GOLD. BY DR. EDMUND NOYES, OF CHICAGO.

A distal filling in a right central incisor, restoring about a fourth of the incisal edge. The cavity had a gold filling in it, which had been made about a year ago. A gold screw had been used for anchorage at the incisal angle. This had proved a source of weakness, the incisal portion of the filling having broken away along the line of the screw. The body of the filling had also been moved outward from the cavity against the lateral incisor, separating the teeth sufficiently to make an operation practicable. The screw remained firm in its seat; this was first removed, and being fortunately so placed as to be grasped gently by the wood-cutting pliers, it was turned out till loosened. The cavity was somewhat extended cervically, and considerably at the cervical portion toward both labial and lingual—the labio-cervical portion being deepened and made more angular with a file, this being the only place where the surface of the filling exposed to view was increased beyond that of the previous filling. The cervical wall was greatly enlarged in the manner indicated, and extended into the lingual surface only slightly, a large anchorage at this point being deemed unnecessary. Very slight grooves were made in cervical, labial and lingual walls, and the hole formerly occupied by the screw was cleaned out with as little enlargement as possible, and the anchorage at the incisal angle was not increased beyond that. The operation could have been made much stronger by cutting away a greater portion of the incisal edge and extending the filling to replace it, but the risk of future fracture, or of unseating the filling, was not deemed great enough to justify the increased mutilation and disfigurement of the tooth.

The filling was made with Pack's cylinders to the rim of the

cavity, and the portions exposed to view with Williams' gold and platinum folds, shade 2, the original size and form of tooth being restored as carefully as possible.

CLINIC NO. 10.

BLEACHING DISCOLORED PULPLESS TEETH WITH 25 PER CENT SOLUTION OF PYROZONE BY CATAPHORIC APPLICATION.

BY DR. JOHN E. NYMAN, CHICAGO.

The bleaching of discolored teeth by means of the S. S. White Co.'s new bleaching electrode was demonstrated. Twenty-five per cent pyrozone to which an equal amount of water was added and the ether evaporated by means of gentle heat, was used. The first attempt was not an entire success, although the condition was greatly improved, owing probably to the fact that sufficient time was not given to it nor sufficient voltage used; thirty volts for thirty-five minutes were used; probably forty volts for one hour would have given a perfect result.

The second case was bleached by Dr. L. K. Stewart, using the same method and was an entire success.

It should be said, however, that the completion of the bleaching process requires twenty-four hours' time, so that a case which seems a partial failure when the electrode is removed, may be found perfectly bleached upon examination a day later.

The electrode is a very clever device and one which promises to be of great value in bleaching operations.

CLINIC NO. 11.

PORCELAIN WORK. BY DR. L. P. HASKELL, CHICAGO.

Dr. Haskell applied the porcelain to a full upper denture, the plate having previously been prepared and teeth soldered, with continuous backing, with foot piece laying on the plate. The case was baked in the Custer electric oven.

CLINIC NO. 12.

TREATMENT OF PYORRHEA ALVEOLARIS. BY DR. G. V. I. BROWN,
DULUTH, MINN.

Dr. Brown presented some models prepared as follows:

Teeth that have been extracted on account of pyorrhœa, with an elastic gum, embedded solidly, except where the pockets would be in the mouth, and those who claim, by any mechanical means,

to be able to clean the surface of the root of all calcareous deposits in the mouth, were invited to try upon the models, with their own instruments and their own methods; afterward the removal of the teeth was to show how perfectly it was done.

CLINIC NO. 13.

CARVING PORCELAIN. BY DR. W. H. TAGGART, CHICAGO.

The clinic was the carving of porcelain showing the minute details necessary to accomplish the desired artistic effect. The teeth carved were upper central and bicuspid. The body used was a very fine grained porcelain mixed with gum tragacanth which makes the unbaked porcelain about as hard when dried out as ordinary chalk. The clinic was given in the neat and clean manner which Dr. Taggart says is an absolute requisite in order to obtain good results; clean coat, clean hands, well blacked boots, clean trays for the porcelain, clean water, clean blotting paper on the bench, in fact everything so clean about the work that the porcelain is surrounded by an artistic atmosphere. The result was exceedingly artistic.

CLINIC NO. 14.

STAINING PORCELAIN TEETH. BY DR. GEO. H. WILSON, CLEVELAND, OHIO.

Consisted of an exhibition of prepared specimens of brown, gray and green stains, defective nutrition, gold fillings, deepening the tone or shade of color of a tooth, and salivary calculus. These were shown mounted upon cards, with explanations, mounted in wax upon the articulator, also mounted upon vulcanite and continuous gum. The *modus operandi* was explained and demonstrated, using the Lacroix mineral paints, and firing them in a muffle made of a small piece of fire clay and a thin piece of folded platinum, and the use of the automaton blowpipe.

A comprehensive description of the process will be found in the March, 1896, number of the *Ohio Dental Journal*.

CLINIC NO. 15.

ROOT FILLING. BY DR. B. D. WIKOFF, CHICAGO.

The roots of five teeth were filled, two lower molars and three upper molars, by different operators. In one lower molar the roots were filled with gutta-percha in eucalyptol and gutta-percha points. It was a success.

The second lower molar roots were filled with chloro-percha and Gramm's copper points. It was a success. The upper molars were filled with chloro-percha and gutta-percha points. One was a success, the other two were only partially filled.

CLINIC NO. 16.

REGULATING APPLIANCES AND THEIR ADJUSTMENT. BY DR. E. H. ANGLE, OF ST. LOUIS, MO.

The object of this clinic was to show the advantage of fixed forms of ready-made regulating appliances over the crude method of hand made appliances invented for each case, according to the old fashioned way. The clinic was largely devoted to my method of soldering, and showing the ease and rapidity with which any of the different combinations of the Angle system can be formed and placed upon the teeth of the patient; also a large number of models of cases treated by this system.

CLINIC NO. 17.

GUIDES TO THE ENTRANCE OF ROOT CANALS IN DIFFICULT CASES.
BY DR. J. AUSTIN DUNN, CHICAGO.

By difficult cases is meant bicuspid and molar, with large cavities decayed below the gum margin, especially disto-occlusal, presenting dead or dying pulps, or alveolar abscess.

To facilitate manipulation and meet the requirements of anti-septic treatment, the writer has found the following method to be a great saving of time and annoyance to both the patient and operator :

The difficulty in this class of cases is:

First, to adjust the rubber dam; second, the difficulty of finding and passing the nerve broach into the canals.

The method proposed to overcome these difficulties is, first, to excavate the cavity without the rubber dam, flushing freely with medicated water, finding and opening the entrance to the canals; second, small wedgwood pegs and copper points, together with the alcohol lamp and Gilbert's temporary stopping, should be provided at hand, and, by means of a hand matrix, the rubber dam and gum is forced back and held firmly with the left hand while the cavity is dried, and either the copper or wood points forced into the entrance of the canals (Fig. 1).

The temporary stopping is then packed in and around the pegs until the cavity is filled. The matrix and points can then be removed, presenting simple "entrance guides" to the root canals. (Fig. 2).

The time consumed in this first operation should not exceed thirty minutes in most cases.

For subsequent manipulations the rubber dam can be easily and quickly adjusted, the treatment made and the entrance guides closed with a very small piece of temporary stopping, making a clean, dry dressing, and thus avoiding the filthy cotton stoppings.

Treating teeth prepared in this way is a pleasure rather than something to be dreaded.

Third, where decay has involved the buccal side, and perhaps the mesial or distal angle, preventing use of the rubber dam for treatment, prepare the cavity, making good anchorages; fix the pegs in the canals and fill permanently with amalgam, in and



FIG. 1.

around the pegs. The latter can be removed before or after the amalgam has hardened.

Fourth, when a tooth is to be crowned, but decayed so as to preclude the use of the dam for necessary treatment, the root should be prepared and the gold band fitted for the crown at once, cement placed about the lower edges and driven to place; the rubber dam is then adjusted and entrance guides found by means of the pegs, as described.

When the treatment is finished and roots filled, the bite is taken, the band removed and the operation completed in the usual way.

The use of a hand matrix is necessary for this class of work, because more or less force is required to carry and hold the rubber dam and gum back so as to clearly expose the cervical borders. It can be bent and adapted to any form of tooth, besides it can be

put in position at once, and is a time saver; by its use also entrance guides can often be made with a temporary stopping, without the rubber dam.

The writer believes that a great many failures in the treatment and filling of root canals is due to the lack of some means to guide and carry the nerve broach, medicaments and gutta percha into the canals, and for this reason urges the use of entrance guides to canals that are small or in such a position as to obstruct sight and free manipulation, in which case a long or short funnel guide can be formed, as described, in two or three minutes, by means of

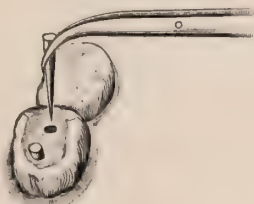


FIG. 2.

which the gutta-percha can be controlled and made to flow directly and readily into the canal.

If doubtful as to the merits and practicability of the scheme proposed, a trial in the way of practice on teeth outside of the mouth is suggested.

CLINIC NO. 18.

A REMOVABLE CROWN FOR SUPPORTING SADDLE PLATES AND REMOVABLE BRIDGES. BY DR. W. E. GRISWOLD, DENVER, COLO.

In making this crown the usual cap with band and pin is made and adjusted on root; a bite and impression taken; the cap and pin are oiled or a little wax flowed over them, so that by warming, it can easily be removed from model with the parts in place on articulator. We proceed to make the crown. First determining the length it can be made, we take two pieces of clasp metal or spring gold about one-eighth inch wide and about one-half inch long. Place them together, and with clasp benders bend them both at same time to a horseshoe shape, leaving the open ends about two lines narrower than the widest part. We

then take the inside one and place on cap in a line with the pin, filing its open ends down so as to allow room for the other to go over and still leave room for good solid cusps to be soldered on the end of it, and articulate with teeth of occlusion. This is then soldered on cap as in Fig. 2, the solder being flowed between its open ends. We now take a fine saw and cut across this spring at its apex, and sometimes enlarge this cut so that the cut will correspond in width to the narrower opening, or about two lines. We



FIG. 1.

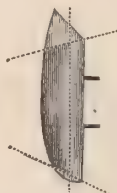


FIG. 4.



FIG. 7.



FIG. 2.



FIG. 5.



FIG. 8.



FIG. 3.



FIG. 6.



FIG. 9.

next take a piece of the same plate 28 gauge, and about same size as cap, and place the outer spring on it and mark where the ends touch, and its width, and cut out this marked space, as at B in Fig. 3. This plate, which I call the foundation plate (as it is the foundation of crown), is then sprung over spring soldered to cap, and adapted to a perfect fit. The outside spring is then placed over this and filed to a perfect adjustment, waxed to foundation plate, and the two removed and soldered from the outside, or at A-A, Fig. 3. It is then sprung to place again, the fit readjusted and tried on, and off, to see if it is held firmly when in place, and

still removed without too much force. The success or failure of finished work is dependent on this point, and if not held firmly spring must be expanded or its box contracted, at point where soldered to plate; but if it works satisfactorily with the parts in place, we file the sides even and to such a width as will allow of facing, if such is desired, and the placing of metal strips on each side. The plate and spring box is then removed and strips of clasp metal soldered on each side, being careful no solder flows inside. It is then placed in position, and has the appearance shown in Fig. 7. We next select suitable facing, back it and wax to place, remove and solder in position. I find in the majority of cases that to get the strength necessary in spring, that the crown must be all gold, or otherwise I take a facing and cut off the pins and reduce it in thickness until it will go in place, cut for length and bevel the ends as in Fig. 4. Then take a piece of pure gold, 32 gauge, adapt to back and beveled ends, making a backing as in Fig. 5. Wax facing and backing in place, invest and solder, filling the space between bevel and foundation plate so as to make it stiff at C, Fig. 8. We now have the foundation plate, the springs, box and facing in place. We now take clasp metal of width and length sufficient to make a plate or curved box which will extend from edge of facing on one side, around the cap to edge of facing on the other side and extend down to the margin of the gum, as in Fig. 6. This is adjusted and waxed in place (the facing slipped out sideways) and box soldered at points of contact. The facing is then put in position, the gold, if need be, readjusted to the lower beveled edge, a suitable cusp struck up of thin gold, 30 gauge, roughly adjusted to the end, waxed in position, and I prefer to articulate in the mouth, as I do all crowns, by placing the parts all together and have the patient chew on it until it is indented to a perfect adaptation to articulating teeth. Then placed on model, the cusp removed, filled with solder, placed back in position, the facing slipped out as in Fig. 8, and cusp soldered to crown. Then the facing is put back and the whole crown polished, giving the appearance of Fig. 9. By having the facing removable it can be used much thinner, and no danger of cracking in the many solderings this method necessitates. By using the box, Fig. 6, we have a light, hollow crown.

By using clasp metal for the work we have greater resistance to the crushing strain of mastication, and less danger of battering of its joint at the juncture with the cap or root.

When the bridge is to be made of continuous gum materials crown could be made of iridio-platinum, and stand the furnace heat. The backing of facing would in this case have to be of platinum.

This removable crown gives a firm but easily removed attachment for all cases where it is desired to remove for cleansing artificial dentures. The ingenious practitioner will see a great many ways in which the principle of construction will be useful to him.

We have found it difficult to get spring gold that would retain its elasticity after heating. To obviate this, in soldering the spring to the cap adjusted to the root, we use a low k solder, about 10 k; as this never has to be reheated, the subsequent soldering can be done with any k desired.

A METHOD OF PLACING GOLD FILLINGS, TIPS OR CONTOUR ON PORCELAIN TEETH.

First the tooth is ground in any desired shape; a piece of platinum foil is brought to a white heat to soften it—holes punched or the foil forced over the pins in the back of facing—then trimmed to fit the tooth, except where filling is to be inserted. This is left wide or long enough to be brought to the front of the facing; another backing of 28 gauge platinum, is cut to the size of tooth, holes punched for pins, placed on tooth, pins bent down to fasten, and if for plastic work, bent so as to be caught and held by rubber in vulcanizing. The first backing of platinum foil is then burnished to the ground surface of tooth, and brought around to the face far enough to be caught and held by investment; then invested, leaving the slot open to be filled with pure gold flowed in with blowpipe; then turned over on face and solder flowed all over backing to stiffen. Cooled, removed from investment, and finished by grinding, emery, paper disks, etc., as you would any filling, always working the gold toward the tooth.

CLINIC NO. 19.

DISTAL CAVITY IN SUPERIOR SECOND BICUSPID OR FIRST MOLAR. BY DR. R. G. RICHTER, MILWAUKEE, WIS.*

Dr. Richter intended to show a method of filling proximate cavities in bicuspids and molars with soft foil and cohesive finish with hand pressure and mallet and by the aid of matrix, avoiding an overhang hard to remove, thereby greatly reducing the labor of finishing the filling.

*Dr. Richter was unable to perform the clinic on account of an injury to his eyes.

CLINIC NO. 20.

THE IMMEDIATE SEPARATION OF TEETH. BY DR. G. V. BLACK, JACKSONVILLE, ILL.

Dr. G. V. Black, in place of Dr. W. W. Walker, made a demonstration of immediate separation of teeth for the purpose of gaining space for filling. The Perry separators were used. The central incisors of a patient were separated sufficiently within a few moments after placing the separator. The plan of keeping the instrument steady and preventing possible pain and injury by slipping against the gum tissue by packing gutta-percha under the bows—between them and the crowns of the teeth was illustrated. In this case it was shown that the separator was sufficiently fixed in position, and so steadily held that it could be used for a finger rest in excavating or filling without inconvenience or pain to the patient. After the removal of the separator the teeth returned to their original position at once.

First and second upper bicuspid's that made very close contact were then separated in a similar manner, and sufficiently to give easy space for finishing fillings to full contour. Afterward a first and second upper molar were separated by the same means, and sufficiently. These separations produced very little pain to the patient; were done quickly; the teeth returned at once to the original position, and little or no soreness followed. The gingival tissues were uninjured, nor was there the least mutilation of the important tissue of the interproximate space.

The points controlling the choice of separators for particular cases, and special circumstances, were explained and illustrated.

CLINIC NO. 21.

Dr. Frank Abbott was unavoidably absent.

CLINIC NO. 22.

A SPECIAL POINT IN ROOT CANAL FILLING. BY DR. A. H. PECK, OF CHICAGO.

Having the canal thoroughly dried and ready for the filling, it should be slightly moistened with oil of cajeput, following this with only enough chloro-percha to slightly moisten the inner walls of the dentine, then the gutta-percha cones should be pressed into the canals as far as possible with the pliers.

Instead of heating the points of the canal pluggers for the purpose of softening the gutta-percha cones for packing, soften them with a few blasts of hot air from the syringe, and this will accomplish the purpose, thoroughly well. The gutta-percha may now be packed easily, thoroughly and with much comfort, because it will not adhere to the plugger point and thus be constantly drawn out of the canal.

CLINIC NO. 23.

A SATISFACTORY AMALGAM FILLING. BY DR. L. W. LYON, ST. PAUL, MINN.

Dr. Lyon was prevented from performing this clinic.

It was to be shown how well a good amalgam filling can be put in when proper care, scientific preparation of the cavity and amalgam and hot instruments are used.

Dr. Black is right, theoretically, in regard to excess of mercury, but it is easier to put in only what mercury is necessary than to squeeze out the excess.

In proximal cavities which shows off the process best, use a matrix, and in private practice allow it to remain on until the next day.

CLINIC NO. 24.

PORCELAIN CROWN WITH BAND, NEW METHOD. BY DR. C. E. ESTERLY, LAWRENCE, KAN.

The method of constructing a porcelain crown with band, that I will describe, is best suited to the bicuspid teeth, but is applicable to the six anterior teeth in a great many cases.

The root is trimmed as for any banded crown to insure fit under the margin of the gum. The end of the root is so shaped as to form two plain surfaces meeting each other in a line (m-d), conforming to the curvature of the arch. The angle at which they meet, varying to suit the case.

The plain surface extending from the crest (M, D,) to (B) the periphery of the root, dipping below the free margin of the gum.

From the crest (M, D,) to (L) the plane may be so inclined as to leave the periphery of the root at this point (L) as high above the gum as practicable, furnishing the maximum strength (Fig. I.)

The post is accurately fitted to the hole in the root, as much

depends upon a strong, well fitting post, whatever style may be used.

For convenience, I have been using a square tapering post whenever practicable. The post (P) is bent to conform with the

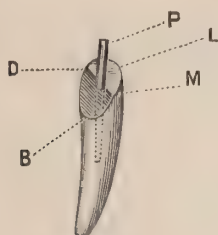


FIG. I.



FIG. III.

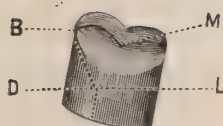


FIG. II.

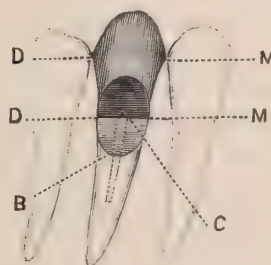


FIG. IV.



FIG. V.

alignment of the teeth, the porcelain facing fitted, the pins bent around it loosely so as to be easily removed.

The oval backed tooth designed by Dr. Hollingsworth of Kansas City, would be the typical tooth for this work, but unfortunately it is not in the market, and we can only imitate it by grind-

ing the ordinary facing. A band of suitable width for case in hand is fitted and the inside is scored with an instrument showing plainly a line corresponding to the periphery of the root. (Fig. II.)

This mark on the inside can be accurately transferred to the outside and a slot sawed cutting out the line (M, L, D). This can be done without bending by using a very fine saw in the ordinary saw frame or with the small circular saw for the engine. A piece of plate is inserted in the slot and soldered. (Fig. III.)

This is trimmed off, and the band thus strengthened can be easily cut to shape as shown in Fig. IV. and placed on the root.

A notch or mark at (C) will mark the opening in the root, and trimming to line (D, B, M,) is completed.

A piece of plate is now soldered over the opening (D, B, M,) completing the cap which does not differ materially from the ordinary cap for roots, but has a unique extension on the inner side which is the feature of the method. The cap is placed in position on the root and the corners (M, D,) are bent against the adjacent teeth at proper points of contact.

The partial cup formed by the extension is for the reception of the porcelain body, insuring increased strength, accuracy in filling the space, materially assisting in forming correct contour and occlusal surface.

A hole is drilled through the cap at point marked, slightly smaller than the pin which has been fitted in the root. When this is driven to place, if a square tapering one, when removed will remain in proper position to be soldered without investing.

The complete metal part of the crown is placed in position, and the partially ground facing is fitted and pins bent tightly around post. (If this cannot be done, it must be waxed in place, invested and soldered.) The tooth is tried in the mouth after first baking and corrections in articulation noted.

The use of this method for the superior anterior teeth prevents fracture on the inner side where there is not sufficient space for porcelain unsupported. The metal used in this crown is either platinum or iridio-platinum, pure gold as solder.

When the crown is completed for the mouth, it is electro-gilded, rendering the color more sightly. Ease of construction, accuracy, strength and artistic results, notably where special coloring is required, are the points I have found this method to possess.

CLINIC NO. 25.

DR. J. W. CORMANY, MT. CARROLL, ILL.

No suitable case could be provided.

CLINIC NO. 26.

AN EXHIBIT OF AMALGAM TUBE FILLINGS. BY DR. FREDERICK B. NOYES,
CHICAGO.

My object in this exhibit is to show that a fairly accurate judgment as to the qualities of an amalgam, with reference to shrinkage and expansion, can be made by the use of the microscope; and also to demonstrate the properties of various alloys, and the modification of them by annealing, or aging, as shown by Dr. G. V. Black, in his exhaustive work on this subject.

I think no man can have any very true idea of the kind of amalgam fillings he is making until he has made a few fillings in these steel tubes and examined their margins with a microscope. In examining tubes that have been filled by others, some of the same ideas can be obtained, but not as well as when the tubes have been filled by the person making the examination. It seems like a very easy thing to fill a hole in a steel block with a good amalgam, so as to make a perfect margin. The microscope shows it to be very difficult, and with a soft amalgam it is simply an accident if the margins are good.

If it is difficult to make good margins in these tubes, what is to be expected of the margins of average cavities?

As alloys are manufactured and put on the market, it is impossible to tell anything about their properties, or whether they will make good fillings or not, without special examination. By taking the pains to make tube fillings, and examining them, a fairly accurate judgment can be made as to the qualities of the alloy. A shrinkage of two ten-thousandths of an inch can be easily seen, and any filling that will shrink that much is not what a dental amalgam should be. An expansion of five ten-thousandths can be made out without difficulty. Small expansions are much harder to detect than small shrinkages, and require more experience.

In order to keep the manufacture of alloys for dental amalgams up to standard, it is necessary that a large number of men in the profession make such examinations constantly, and not be

afraid to say what the microscope reveals to them. From clinical experience alone it is impossible to tell whether an amalgam is all it ought to be or not.

In order for any man to make such examinations it is only necessary for him to have a few steel tubes (I obtained mine from the "Dental Protective Supply Co."), and the use of a binocular microscope, with a half-inch objective or a similar power.

Dr. Black's work shows, without any possibility of question, that alloys can be made by the manufacturers of dental amalgams, and put on the market so that fillings made of them will neither shrink nor expand; that these alloys will not change in their properties when on the market or in the office, if treated with ordinary care and that a wide range of formulæ is possible, with varying qualities of color, strength, etc.

In preparation for this exhibit I have repeated Dr. Black's experiments. Dr. Kester has cast the alloys according to Dr. Black's formulæ. The alloys have been treated after Dr. Black's methods, and we have been able to reproduce his results, so that in the tests the tube fillings are almost exactly parallel with those made by Dr. Black last summer.

In order to furnish such alloys, however, it will be necessary to use much greater care in mixing the metals, in cutting, and (most important of all) in the treatment of the filings before they are put on the market.

It is necessary that more than the composition of the alloy be known in order to know beforehand that it will make a good filling. The composition of the ingot must be known. That is, part of the metals weighed into the crucible must not be lost in melting. The time and method of cutting, and the treatment of the filings in regard to heat since cutting must be known.

In order to hold the manufacturers up to these added requirements it is necessary that many men in the profession interest themselves enough in the subject to test the alloys that are furnished them. The tests are not difficult or expensive, and it is the only way to know that the amalgam we are using is, what it ought to be, and what in the present state of our knowledge it can be.

One other point—dental amalgams so manufactured as to give neither shrinkage nor expansion, can be made to set either quickly

or slowly, and to work more or less plastic through a considerable range.

No.	TUBE.	ALLOY.			CONDITION.	PER CENT. Hg.	CON.	EX.
1	A F	40	Ag.	60	Sn.	Fresh cut.....	.50	.07
2	K	40	"	60	"	120°, 5 days.....	.50	.05
3	A H*	40	"	60	"	220°, 15 minutes..	.50	.09
4	A C*	40	"	60	"	130°, 2 days.....	.50	.08
5	B*	40	"	60	"	130°, 7 days.....	.50	.08
6	N	55	"	45	"	Fresh cut.....	.50	.01
7	S	55	"	45	"	120°, 5 days.....	.50	.07
8	T	55	"	45	"	220°, 15 minutes..	.50	.13
9	M	65	"	35	"	Fresh cut.....	.50	.01
10	Y	65	"	35	"	One year old.....	.50	.06
11	R*	72½	"	27½	"	120°, 7 days.....	.55	
12	A i*	73	"	27	"	Fresh cut.....	.55	.33
13	X	73	"	27	"	120°, 20 hours....	.55	.05
14	A D*	73	"	27	"	130°, 8½ hours....	.55	.01
15	D*	73	"	27	"	150°—120°, 4 hrs..	.55	.01
16	AA	73½	"	26½	"	Fresh cut.....	.55	.28
17	I	73½	"	26½	"	120°, 8 hours.....	.55	
18	L	68½	25½,	Au 5	Zn 1	Fresh cut.....	.55	.18
19	W*	68½	25½,	Au 5	Zn 1	120°, 21 hours....	.55	.02
20	A L	68½	25½,	Au 5	Zn 1	120°, 24 hours....	.55	.01
21	C	68½	25½,	Au 5	Zn 1	120°, 7 days.....	.55	
22	A G*	68½	25½,	Au 4	Bi 1, Zn 1	120°, 4 days.....	.55	.01
23	H*	Aluminum 5%.						.455
24	A*	On the market.					Very large shrinkage.	

NOTE 1.—*The tubes marked by the star were filled by Dr. Black in his work, the results of which were published in the *Cosmos* for December, 1896. The rest of the tubes were filled by me for this exhibit except tube AA, which was filled by Dr. Kester.

NOTE 2.—The per cent of mercury is that used in mixing, not the per cent in the finished filling, more or less was squeezed out.

The table is made in terms of the micrometer instead of those of the microscope because of the difficulty in accurately describing the microscopic appearance. In looking over the table it is only necessary to remember that a shrinkage of two ten-thousandths shows a breaking of the margin and usually a distinct crack; an expansion of five to ten shows the amalgam distinctly lifted above the margin of the steel. A smaller expansion can usually be detected by a very apparent disturbance of the margin and no appearance of a crack.

In the table, by condition, I mean the treatment the filings have received since cutting. In other words their condition in reference to annealing or aging.

We will divide the table into three portions, to illustrate the changes in properties of the alloys by various proportions of silver and tin.

First. Nos. 1-5, 40 per cent silver; 60 per cent tin, the characteristic of the alloys containing less than 50 per cent of silver is their double movement. First shrinking, then expanding. In the fresh cut alloys (tube AF., No. 1) the expansion is the greater, and though the amalgam is distinctly above the level of the steel the margins are left wide open, by the primary shrinkage. The double movement seems to have some of the tendency which has been called spheroiding. In annealed specimens the shrinkage is much greater than the expansion.

Second. Nos. 6-8, 50 per cent silver 50 per cent tin to 65 per cent silver 35 per cent tin. This range gives the greatest shrinkages. Fresh cut, the alloys expand but slightly. When kept at 120° after cutting, or allowed to stand in a room at ordinary temperature, it shrinks more and more until full annealing or aging is reached.

Third. Nos. 9-17, 65 per cent silver 35 per cent tin to 75 per cent silver 25 per cent tin. The alloys in this range, when fresh cut, expand more or less, as the proportion of silver is higher or lower. By annealing the expansion can be reduced to zero or slightly below it, for the higher members of the group, while the lower members can be made to shrink decidedly.

Alloys containing over 75 per cent of silver expand very greatly when fresh cut. Annealing reduces this expansion but cannot be made to overcome it entirely.

Nos. 18-22. Show two formulæ which Dr. Black has suggested as likely to meet the requirements of a dental amalgam. The first one has been under examination for more than six months and has stood the tests. The table will show that when fresh cut this alloy expands decidedly (No. 18, tube L). It also works harsh and sets very quickly. Annealing reduces this expansion; causes the amalgam to work more and more softly, and increases the time of setting to the range of easy manipulation. (No. 19, 20, 21, tubes W. A. and C.)

When fully annealed the amalgam neither shrinks or expands, and with filings exposed since annealing to all sorts of conditions within the range of ordinary experience, for six months, Dr. Black has been able to observe no change in their properties.

In closing the explanation of this exhibit let me say that Dr. Black has not finished the work on the amalgams. He has given the profession a truly scientific basis on which to begin the study, and the dental profession should be profoundly thankful to him. He has shown that a large number of formulæ are possible, all of which will make good dental amalgams, but his work restricts these formulæ within a narrow range. He has shown the profession where to look for a good alloy and how to treat it so that it will make a good amalgam. It now remains for the profession to insist on the manufacture of such alloys.

CLINIC NO. 27.

A METHOD OF REPLACING A BROKEN FACING ON A BRIDGE OR RICHMOND CROWN. BY DR. J. B. MONFORT, FAIRFIELD, IOWA.

All crown and bridge workers have their patients come back to them sometimes with a facing split off, bringing the same in their hand, carefully preserved. The question is how to repair damages. It is often difficult to find a tooth just the color and size to replace the broken one. Then, if you do, the pins are not in the same relative position as the broken one, making it difficult to drill the holes just the right place.

Remove the remains of the tooth, cut off the pins, drill two holes the size of the pins of teeth, parallel to each other, through the backing, usually about the same position that the pins were; but this is not particular. Into the concavity of the backing burnish a piece of thin platinum, punch holes to correspond with holes in the backing; into these holes drop two platinum pins, taken from broken teeth, with the heads up. Remove carefully, and solder pins to platinum with pure gold. Then replace in the concavity, trim and burnish so as to fit perfectly. Into this matrix drop some hard wax; when hard remove and invest, pins down, in plaster and silex; when hard remove wax. Now take porcelain body of the proper shade, mix as stiff as possible and fill the platinum matrix; take the broken facing, place it over the body and press into place, removing excess of body; place this over a gentle heat to thoroughly dry the body, then place in your furnace and fuse. When cool it is ready to put in place in the bridge. You will find it will fit perfectly. Place a little cement in the concavity of the bridge and press it home. The pins may be either cut off and riveted or secured by burs run on the pins, using Dr. Bryant's repair instruments.

I have replaced a number in this way, and they have stood the test. I use the Downey furnace and body.

CLINIC NO. 28.

BY DR. C. W. JONES, ST. PAUL, MINN.

The first case is as follows: Patient with teeth so sensitive that on a previous day an attempt had been made to excavate a mesial cavity in the right inferior molar, but was found too sensitive to complete the excavation, and a temporary filling of cement had been inserted. Upon removing the cement the cavity was found very sensitive.

As there was also a cavity in the adjoining tooth, an electrode made of spring wire, and bent somewhat V-shaped, was placed in position with a pair of pliers, so that it remained firmly in position, and conducted the current to both teeth simultaneously. With a 15 per cent solution made from N. S. Hoff's formula cocaine tablets, in about thirty minutes' time, both cavities were so thor-



FIG. 1.



FIG. 2.

oughly anæsthetized that deep grooves for retaining form were drilled without the least pain to the patient. I think a little more time was given than was necessary in order to insure complete anæsthesia. The apparatus used was the Victor battery outfit, with a pressure of 15 volts. I consider 15 volts sufficient pressure for any case. I use a similar electrode for anterior approximal cavities, but bent so that the ends spring toward each other and grasp firmly a pledget of cotton placed in the cavities between the teeth. If insulation of one end is necessary a small piece of fine rubber tubing is placed over that end of the electrode, or if insulation of the adjoining tooth is necessary all that is necessary is to place between the teeth a small piece of mica.

These electrodes are a great convenience, as it is unnecessary for the operator, or an assistant, to hold the electrode in position.

CLINIC NO. 29.

EXHIBITION OF SURGICAL CASES AND SURGICAL CLINIC. BY DR. T. W. BROPHY, OF CHICAGO.

No. 1. Patient, age twenty-six years, a male. Syphilitic necrosis of the hard palate.

Operation. Removed sequestrum, leaving large opening in palate; will close when the general condition of patient makes it expedient, or cover the parts with a plate.

No. 2. Patient, age thirty-six years, female.

Necroses of alveolar process of left half of the superior maxilla involving a portion of the hard palate.

Operation. Removed sequestrum, no opening through palate. After treatment antiseptic irrigation.

No. 3. Patient, aged twenty-one. Closure of the jaws.

Diagnosis. Contraction of muscles of mastication following typhoid fever.

No operation. Directed use of dilator daily.

No. 4. Patient, age twenty-seven, female. Empyæma of antrum; opened through socket of second molar tooth, irrigated with boracic acid solution. Directed cleansing by irrigation twice a day, and the use of $1\frac{1}{2}$ per cent solution of nitrate of silver.

No. 5. Patient, aged three years. Cleft palate extending through the horizontal plates of the palate bones and within three-fourths of an inch of the incisor teeth.

Operation. Freshened edges of cleft, elevated soft parts including periosteum from hard palate, introduced silver sutures and fixed them to lead plates so adjusted as to exert tension on the palate and bring the freshened edges in contact; coaptation sutures were introduced to hold the edges together. Lead plates in this operation serve as a splint to greatly diminish the palate's movements, thus rendering union almost certain.

In addition to this great advantage we have tension exerted on the palate, its whole length instead of the very limited surface only through which the sutures pass and upon which tension is made.

Six days following the operation the coaptation sutures were removed, and five days later the lead plates and silver sutures were removed, the palate was perfectly restored and the patient was dismissed.

Several cases applied for examination, but no other operations were performed.

CLINIC NO. 30.

ALVEOLAR PERIOSTITIS (RIGGS' DISEASE). BY DR. JUNIUS E. CRAVENS,
INDIANAPOLIS, IND.

In the progress of this (Riggs') disease, the only tissue really destroyed is alveolar process, principally confined to the walls of

the alveoli and to the septa, and save exhibition of some incidental calculary deposits, there is nothing in the condition of roots freshly extracted from affected cases to prove action of the disease. It would thus appear that this is not strictly a dental disease; my observation has failed to find that the pericementum is a participant, but rather is affected to some extent by certain results of the disease.

I hold that what is called pyorrhœa alveolaris (Riggs' disease) is a periostitis, that finds origin on the surface of the alveolar ridge, usually between the teeth, and later by "extension" invades the alveoli. We find clinically, a mass of soft tissues, highly vascular in the pus "pocket," this is equivalent to what in ordinary periostitis is known as "new granulation tissue," to the agency of which pathologists ascribe the destruction and removal of bone (ostitis). In Riggs' disease the destruction of alveolar process (pocketing) will continue as long as this granular mass continues undisturbed. I consider the serious laceration, and even removal of this granulation tissue a necessity to possible cure. The chronic and destructive condition of this tissue must be changed to the acute, which results primarily in marked contraction of superimposed gum tissue, secondarily in what Dr. Dawbarn describes as "noninfective periostitis" in which "we have as a result an ossific deposit. The beginning of development of new bone about the deeper exposed or denuded part of the root.

For descriptive convenience I have used the term orbicular periostitis in reference to the inflammatory condition that occurs on the ridge about the necks of teeth, and which is, in my opinion, the more frequent beginning or origin of pyorrhœa alveolaris. Also, from the character and conduct of the disease, as observed by myself, I have resorted to a term—alveolar periostitis—as the most appropriate for a name for this affection. As to the calculus deposited within the "pockets" of this disease, certain characteristics show it to be entirely different from salivary calculus; also, certain analyses of saliva and of pus satisfy me that the deposits found in these "pockets" come directly from the pus with which the exposed root is bathed, and thus I have presumed to call it "pyonal" calculus. I disclaim any intention of inflicting a nomenclature or terminology of my own upon the dental profession, and do not anticipate that these names will be adopted to any extent. It is hoped this deflection from the strict line of the clinic will be pardoned.

The clinical value of hot water is triple; at 140° F. germicidal action is reasonably assured, while there is safety from scalding. Hot water projected into a pus "pocket" with force will promptly and effectually dislodge all pus and everything else movable; therefore it has a sanitative value. It is an astringent of mild character, and the best local stimulant for either traumatic injuries or congested tissues; therefore its therapeutical value. The first step in this treatment consists in a protracted or persistent douching of each pus "pocket" with water at 140° F. The local application (topical) of saturated solution of cocaine, in either water (198 per cent), chloroform (8 per cent), or alcohol (25 per cent) within the "pockets," immediately following the hot water douching, usually produces a most grateful obtunding of the tissues involved in subsequent procedure.

The second step consists in removal of all calculus from the surface of the root, and laceration (and possible removal) of the "granulation tissue" certain to be found in the depth of the "pocket."

After the surgical procedure, thoroughly wash out the "pocket" with hot water, and treat with a solution of sulphuric acid (10 per cent, or one part comm. sulph. acid to ten parts pure water). This completes the first sitting or treatment. The after pain from the sulph. acid may be mitigated by again douching the "pocket" with hot water and applying cocaine.

Alcohol is a sure antidote for the disagreeable local effect of cocaine, and ingestion of whisky or dilute alcohol will soon dissipate brain effects. I often prime a patient with whisky before applying the cocaine.

After four or five days, I have the patient return for the secondary treatment, which consists in first douching the "pockets" with hot water, as in the first instance, except that by degrees the temperature is raised to 150° F. (beginning with 140° F.). The secondary treatment is closed by thorough flooding of the "pockets" with a 10 per cent solution of nitrate of silver.

I confidently expect this treatment to result in prompt cure of the disease, but do not promise patients that lost gum tissue will return.

Sanitary care of the mouth thus treated must depend on the patient, whom I instruct to rinse frequently with a solution of alum, or borax in rain water, and enjoin strict abstinence from use

of soaps or soda in the mouth, soapy dentifrices or washes. Common pulverized sulphur makes the best dentrifice for these pyorrhous cases, but is rather disagreeable to use, so that the patient must be impressed with the importance of it for a term of weeks at least.

CLINIC NO. 31.

PRACTICAL EXHIBITION OF FACIAL RESTORATION BY ARTIFICIAL DENTURES. DR. A. O. HUNT, CHICAGO, ILL.

It is difficult to give a good description of this clinic in a limited space. The doctor had several persons—male and female—selected from clinical patients to exhibit.

It was demonstrated clearly the importance of the study of each particular feature of each individual in order to accomplish the correct restoration of the features. The various muscles of expression that enter the orbicularis oris were manipulated by the form of the denture as well as by the establishment of the normal relation of the teeth to the lips, the reproduction of the canine eminence, the incisive and canine fossæ. Two of the cases exhibited were the work of students of the college, showing some very pleasing results. The doctor has promised to write a paper on this subject for the next meeting of the Illinois State Dental Society. He will then present the matter more elaborately. Illustrated with casts and drawings.

CLINIC NO. 32.

FILLING WITH SEMI- AND COHESIVE GOLD A CAVITY IN A SUPERIOR INCISOR. BY DR. M. L. HANAFORD, ROCKFORD, ILL.

Having adequate previous separation, the lingual wall is to be cut well away for the purpose of giving free access, and the work of preparation and introduction of the filling performed entirely from the under (palatal) surface.

This method of preparing the cavity has for its purpose only partly the concealing of the gold; the main advantage being the extent to which the cutting may be carried without materially weakening the tooth or mutilating it from an æsthetic point of view.

For retention the cavity will be made very slightly larger (inside) in two and possibly three directions than at the periphery.

One or two shallow pits will be made in the basal seat of the cavity for the purpose of securely engaging the first pieces of

gold, which, however, will form no part of the retaining scheme.

Finely serrated pluggers and hand mallet force will be used in introducing the filling.

The intention will be to fully restore the contour in the direction of the adjoining tooth, but sloping sharply away lingually, gaining less of bulk than before decay had taken place.

CLINIC NO. 33.

COMBINATION OF PRECIPITATED GOLD AND OXYPHOSPHATES. BY DR. W. V-B. AMES, CHICAGO.

Dr. Ames demonstrated the method of combining precipitated gold and oxyphosphate of zinc. The gold used is in loose crystals of about the form of those composing "White's Crystal Mat Gold." The brownish color of crystals depends on the formation of a film of oxide of gold on their surfaces during the process of precipitation.

It is evident that this film of oxide enters into the cement formation making the gold truly a part of the mass rather than a foreign mixture, as would be the case if bright yellow crystals were used.

The gold precipitate is added to the acid to the extent of forming a more or less stiff paste previous to the addition of the zinc oxide.

CLINIC NO. 34.

ARTICULATION OF CROWNS. BY DR. C. R. BAKER, DAVENPORT, IOWA.

The clinic showed the construction of crowns with a perfect and useful articulation in every case without the necessity of keeping several sets of dies or several hundred cusp forms, and from these spending much time in making the proper selection of each tooth.

With set forms we are very apt to get either no articulation, or after the crown is set it will have to be ground away so much that all beauty or natural shape will be lost, and very often a hole will be made or the gold will be ground so thin that it will very soon be worn away.

In the anterior teeth it is often impossible in the case of an overlap of great extent or an irregularity to tell the length that a crown may be made with the use of the ordinary articulator. So that we are apt to either make the tooth too short, or, as is often done, leave the edge with a large amount of gold showing. Again, the gold is often ground down so that it gives no protection to the

porcelain face. To overcome all these difficulties some four years ago, I made a small articulator of the Bonwill pattern. With this articulator imitating all the movements of the jaw, we are able to tell the exact position of the teeth with the jaw in any position. I first make my band or cap in the case of the front teeth, and with this in position have the patient bite into impression compound, thus obtaining a perfect impression of the teeth in proper position. See that the band or cap is in position in this impression, then run it up on the articulator. For teeth posterior to the cuspids I simply press soft wax in band, then close the articulating models in all positions, trim off the wax around the edge of the band, and with but very little carving we have a good model from which to make a die in fusible metal; this can be driven into lead, or by coating with glycerine a counterdie can be made of the same material and the cusps thus swaged and soldered on the band. One other little point I will mention here. In making a porcelain faced bicuspid I usually fit my facing and solder my backing to the band before making the cusps.

The anterior facings may be ground and fitted so perfectly that the gold need not show on the edge although it covers all parts which are exposed to any force from occlusion. The movements of the articulator will give the exact length that the tooth can be made and there will be no fear of being obliged to grind away the edge afterward. The overlap of the anterior teeth and cusps of the posterior teeth act as guides in all cases.

CLINIC NO. 35.

GOLD FILLING, DEMONSTRATING THE USE OF NONCOHESIVE GOLD. BY
DR. J. Y. CRAWFORD, NASHVILLE, TENN.

The feature of this operation was to demonstrate the use of Abbey's noncohesive gold in the filling of all cavities that have uniform retainers throughout the entire cavity; the principle of contour not being involved, suggesting the reason why it makes the better filling for the preservation of the tooth than the cohesive or semi-cohesive gold.

CLINIC NO. 36.

ANÆSTHETIZING OF PULP FOR IMMEDIATE REMOVAL BY CATAPHORESIS.
BY DR. W. W. MOORHEAD, ALEDO, ILL.

The method of treating such a case is as follows:

The rubber dam being adjusted, the cavity washed out, and sterilized, place a pellet of cotton saturated, but without a surplus

to run around the other teeth, with the following medicament in the cavity:

Cocaine.....	grs. 18
Aconitine.....	grs. $\frac{1}{10}$
Thymol solution, Q. S.....	3i

To this apply the positive current, turn on fifteen or eighteen volts, and should this not be sufficient to reach the apex make a second application, and remove the pulp immediately.

CLINIC NO. 37.

OBTURATORS AND REGULATING APPLIANCES. BY DR. C. S. CASE,
CHICAGO.

Dr. Case showed a difficult case of regulating of teeth for a cleft palate patient, followed by the insertion of an artificial palate. He describes it as follows:



FIG. I.

In the original position the upper incisors were badly inlocked by the lowers, and, as is quite common with cleft palate irregularities, they also stood at a decided lateral inclination, as shown by models. This, in connection with the fact that the cleft, though the maxilla was complete, with concomitant instability of parts, rendered correction one of the most difficult I have ever undertaken.

Within six months' time the incisors were carried bodily forward and placed in an upright position. A cuspid on the opposite side of the cleft was brought down from a high position of retarded eruption, and so placed at the border of the cleft to take the place of the lateral incisor, which was deformed, and consequently extracted.



FIG. II.

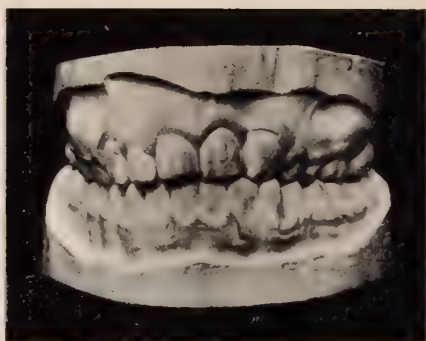


FIG. III.

The regulating was finished December 24, 1896. January 4, 1897, the artificial palate was inserted. January 6, the patient was exhibited at the Chicago College Alumni Clinic. At this time the patient had never been able to make a sibilant sound—s, sh, ch, or the explosives, d, t, k, g, etc.;—from which can only be imagined



FIG. IV.

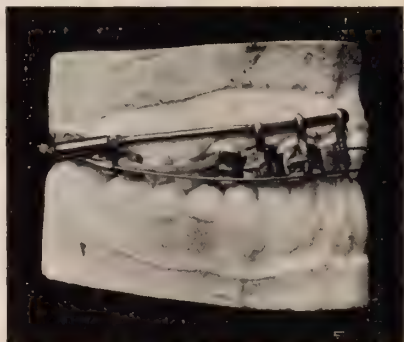


FIG. V.

the decided imperfection of her speech. It was so imperfect that it was embarrassing even to ask her to say anything, because of the probability that I should not be able to understand—which always gives great annoyance to patients affected in this way.

The first palate, which was worn about a week, was made as I commonly do, with the veil thin and abridged, so as to give the least possible irritation to the sensitive mucous membrane. After this the size was developed in thickness and length to meet the requirements of speech. It may be said that the first two weeks were consumed before she obtained an instrument that could be of any aid to her in oral enunciation. After this, under proper instruction, the improvement has been so phenomenally rapid that now, after a little more than two weeks, it will be seen that she possesses full command of every requirement for perfect enunciation.

She has learned to whistle like a boy, also the shrill whistle with two fingers in the mouth, which requires a large and forcible volume of air, showing that she has already acquired the power to completely close, at will, the naso-pharyngeal opening and send all the air which is the vehicle of voice and spoken language through the mouth.

She is able to make every vocal utterance with perfect enunciation, with the exception of the explosives made at the posterior dorsum of tongue and palate, on the hard sounds of c and g—which may be acquired within the next week.

CLINIC NO. 38.

GOLD FILLING. BY DR. K. B. DAVIS, SPRINGFIELD, ILL.

Dr. K. B. Davis, of Springfield, Ill., filled a proximal cavity in the left upper second bicuspid, using the Harris' mallet. After thoroughly excavating and properly shaping the cavity he cut away the labial and lingual walls and then in inserting filling restored these walls with gold, thus demonstrating the proper method of filling this class of cavities so as to prevent a recurrence of decay.

CLINIC NO 39.

ROOT FILLING. DR. J. G. REID, CHICAGO.

Filling roots with chloro-percha and gutta-percha points. Nothing essentially new was presented further than softening the point in the canal by means of a hot air blast directed from a hot air syringe, and packing with a proper shaped instrument while hot. Having the gutta-percha point thus heated in the canal and packed with a cold instrument prevents the withdrawal of the material from the canal.

CLINIC NO. 40.

A SUITABLE EQUIPMENT FOR MAKING ANY KIND OF CROWN OR BRIDGE,
WITH PRACTICAL DEMONSTRATION. BY DR. G. D. SITHER-
WOOD, BLOOMINGTON, ILL.

Dr. Sitherwood exhibited and demonstrated the use of a cabinet work table made of oak, 3 feet 10 inches high, 2 feet 10 inches long, and 21 inches wide; enclosed on three sides and closing with a folding top, that locks with a single key. The main shelf or working place is overlaid with a single sheet of aluminum. On this at the left side stands a small gas furnace for porcelain work, the foot bellows under the table being fully twice the size ordinarily used. Near the furnace toward the center of the table is a small grinding and polishing lathe run by electric power. The lathe carries three grinding wheels of different sizes and grade of fineness. A large Bunsen burner, Bunsen warming-up pan, oxy-hydrogen blowpipe, revolving filing block and anvil, a set of dies for striking up gold crowns, a case of twenty-four different colors of porcelain body, with brushes, spatulas and mixing slabs; two shelves and numerous drawers filled with the best and most suitable instruments used in the construction of a crown or bridge completed the outfit. It is designed as a time saver for mechanical work in the operating room beside the chair, and after three years' use in the doctor's own office is offered as a suggestion to other busy dentists. There is no patent, neither does the doctor manufacture the outfit for sale.

In the practical demonstration a gold crown was made of 22 karat gold, gauge 30, using 22 karat solder, with the Bunsen burner instead of blowpipe. No lap was made in any part. A soft lead pencil used on the outside where the wire passes prevented the solder from attaching or following the wire. While the crown was quite hot it was dropped in a little alcohol, which serves the purpose of an acid bath, only it is quicker and better. A porcelain crown was made using pure platinum (gauge 31) for root cap, no lap in the band, and soldering with pure gold, by holding it over the Bunsen burner. Iridio-platinum wire was used for the root pin, which was not soldered to either the cap or flatback. Little notches were filed in the root pin, and the pins of the tooth bent into the notches and crossed. The porcelain body was then added and backed to the tooth and pins, the statement being made that a single tooth thus made was stronger and better or less liable

to fracture in the mouth than where the cap and pins are first soldered with pure gold, the latter proceeding being only a waste of time and useless.

CLINIC NO. 41.

CONTOUR GOLD FILLING. BY DR. C. N. JOHNSON, CHICAGO.

Dr. Johnson filled a large mesio-occlusal cavity in an upper first molar for Dr. F. E. David, of Sandwich, Ill. The filling was started in the linguo-gingival corner with a rope of unannealed gold foil containing one-fourth of a sheet of No. 4. A similar rope was then forced into the bucco-gingival corner, and the two ropes thus extended across the seat of the cavity and formed a cushion against which ordinary pellets, annealed, were condensed. As the filling approached completion, rolled gold No. 60 was used to gain uniformity of density on the surface. This cavity had been prepared at a previous sitting, January 7, and on the day of the clinic was measured by Dr. E. K. Wedelstaedt, of St. Paul, who has kindly furnished the following record. If compared with the measurements of a cavity prepared by himself on the first day of the clinic and recorded on another page, the similarity of dimensions will be noticed.

RECORD BY DR. WEDELSTAEDT.

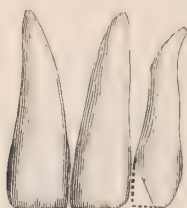
TOOTH, UPPER LEFT FIRST MOLAR.	MILLIMETERS.
Length of crown (gum to occlusal surface).....	6.9
Width of crown mesio-distally at gingivæ.....	10.5
Thickness of crown linguo-buccally at gingivæ.....	11.5
Greatest thickness of crown linguo-buccally.....	11.5
Cavity mesio-occlusal, occlusal anchorage.	
Width of cavity linguo-bucco-gingivally.....	6.0½
Width of cavity linguo-bucco-occlusally.....	7.0
Width of seat from axial angles to margin of cavity.....	1.9
Width of step linguo-buccally.....	4.7
Width of anchorage linguo-buccally	3.7½
Length of step mesio-distally.....	3.9
Depth of cavity from seat to the margin of cavity (apico-occlusally).....	6.0
Depth of cavity below step (apico-occlusally).....	3.2
Depth of anchorage (apico-occlusally).....	2.6
Depth of step (apico-occlusally).....	3.2

CLINIC NO. 42.

GOLD FILLING. BY DR. R. H. KIMBALL, CHICAGO.

This clinic illustrates a method of preparing cavities in exceedingly fragile incisor teeth often employed by me:

Instead of removing any thin lingual portion of the tooth, I would shape and smooth the edge and permit it to remain, and cut freely in a curved line into the strongest part of the palatal side of the tooth where there is the least danger of fracture in the use of



LABIAL VIEW.



PALATAL VIEW.

the tooth. The cut shows clearly the manner in which the filling is thus anchored in the soundest portion of the tooth, and by carrying the curved excavations well around, the filling is made to materially assist in its own retention. At the cervical portion of the cavity I would cut as usual, being careful only to retain as broad and *square* a base as possible for the filling.

A particular advantage in this preparation of cavities is the avoidance of the necessity of cutting further in, or across, the already weakened incisal edge, and the gold can be brought up to and carried over such edge much more safely than if further weakened by cutting.

CLINIC NO. 43.

PROXIMAL FILLING WITH PLASTIC GOLD. BY DR. H. T. SMITH, OF
CINCINNATI, OHIO.

A large cavity in the distal surface of an upper right lateral incisor was prepared; one-third of the cavity was filled with Ames' precipitated gold, using the hand mallet. The rest of the cavity was filled with No. 60 rolled foil, using the Powers' engine mallets. The cohesion of the heavy foil with the plastic gold was sufficient to make a strong filling, and the plastic gold facilitated starting the filling without weakening undercuts and retaining pits in a frail tooth. The straight form of Powers' mallet, used with the slip joint connection, is especially convenient, and the right-angled form is useful in building gold upon lingual surfaces and on account of its compact form for use in buccal and other cavities difficult of access.

CLINIC NO. 44.

PORCELAIN-FACED BICUSPID CROWN. BY DR. B. D. WIKOFF, CHICAGO.

Trim the root by thoroughly removing all enamel and cutting the front of the root a little below the gum line; measure the root; make and fit band; mark the gum line on band, then take plaster impression and bite together by putting a little plaster over the band and adjoining teeth; then have patient close the teeth together and hold firm until plaster is hard; varnish, and pour as any plaster impression.

After you get the models, select one of the Hollingsworth cusps suitable for the case; then make die and stamp cusp of pure gold; cut out front of cusp, then fill with 22 k. solder; put on file and level it, then place cusp and band together and wire or put on soldering block and hold together with a clamp, and heat until the solder in cusp will unite band and cusp; then saw out the front of the band; grind English facing to fit opening, allowing for thickness of backing; back with pure gold; trim flush with facing; wax the backing in the opening with a little hard wax; remove facing; cover backing with a paste of stove polish or graphite; then invest in whatever you are accustomed to using with one side up; flow enough solder to catch the backing, and band together; remove from investment, fill inside of crown, and cover the backing with the stove polish or graphite paste; dry and finish, soldering, flowing solder on outside of band to make the contour. After you have finished soldering, replace facing with a film of cement. When that is hard, bend pins to either side; grind facing and all in finishing, then polish.

CLINIC NO. 45.

AMALGAM FILLING, PLATINA LINING. BY DR. P. HOLME MORRISON,
ST. LOUIS, MO.

To prevent the discoloration of the tooth as the result of an amalgam filling, or to prevent it from showing through the thin walls of a very large cavity, where for any reason it is advisable to preserve a bicuspid or cuspid with that material, the following is the procedure:

Remove all caries, except over the pulp, keep the cavity dry with French bibulous paper, or in the case of lower teeth, the operator uses a tongue depressor. Then line the cavity with Williams' gold and platina folds, thickness 30, shade 3; use what is

sufficient to line the cavity and partially adapt it to the walls of the cavity, then fill as usual with amalgam. The gold will show through the tooth, as though it were a gold filling, and the platinum will prevent the mercury of the amalgam from uniting with the gold which faces toward the walls of the cavity, and thus prevent staining or showing of amalgam through the thin wall.

CLINIC NO. 46.

METHOD OF ATTACHING BRIDGES TO ANTERIOR TEETH WITHOUT
AMPUTATION OF NATURAL ROOTS. BY DR. S. FINLEY
DUNCAN, JOLIET, ILL.

Open pulp chamber and root canal through lingual surface of tooth and in a line with root canal. Enlarge opening and canal and cut a groove to the proximal side of tooth next to the space to be bridged. Into the opening and groove burnish pure gold plate about 28 or 30 gauge. Make a small opening through gold plate opposite root canal. Force iridio-platinum wire, square, about 16 gauge and pointed, through plate and up into root canal. Remove plate and wire post together and solder with 22 karat solder.

Place back in position in tooth and fit accurately to margins of groove preferably with a foot shaped serrated plugger. Remove, invest and flow 20 karat gold or solder on lingual side of plate until it has the proper shape and contour; thus forming what may be termed an inlay for want of a better name. The bridge may then be soldered to this in the same manner as to any other abutment, and the entire appliance cemented into place.

CLINIC NO. 47.

MESIO-OCCLUSAL GOLD FILLING; ELECTRIC PLUGGER. BY DR. CLAUDE A.
SOUTHWELL, MILWAUKEE, WIS.

The clinic of Dr. Southwell showed a typical mesio-occlusal gold filling with the buccal and palatal surfaces self-cleansing, that is the buccal and palatine walls were beveled so that the gold extended to the surfaces mentioned. The edges were beveled with chisels and sandpaper disks. He made a goodly sized occlusal surface opening, so that the cervical was in full view. A groove in the cervical portion of the cavity served as a starting point. The doctor used Rowan's extra pliable decimal gold rolls, assorted sizes during the operation and some sheet gold. The electric

plugger was employed when the sheet foil and the automatic mallet when using the large cylinders of gold. The filling was finished with plug finishing burs, disks, pumice and lastly with tripoli. He desired to show the easy working qualities of Rowan's gold so adaptable to the walls, and to the busy operator the advantage of using it.

CLINIC NO. 48.

A METHOD OF USING PORCELAIN TEETH IN BRIDGES WITHOUT TIPPING THE GRINDING SURFACE. BY DR. F. F. FLETCHER, ST. LOUIS, MO.

The clinic related to two bridges. First showing method of using porcelain teeth as dummies in bridge work without tipping them with gold. The backing is extended to include both proximal and buccal surfaces. The buccal being cut out to within a line and a half of the gum line, punch hole 1 through backing, slip it over one of the pins; bring around proximal, buccal and opposite proximal to other pin mark and cut out buccal surface, then fit and burnish carefully to place and punch hole 2 in backing, slip over pin, burnish to place and solder. This gives a socket of gold for porcelain to rest in, the gold on ridge and buccal surfaces supporting tooth and relieving pins from strain they cannot support. To secure perfect fit to gum, swage or burnish gold or platinum to ridge and set tooth as already backed on plate and solder, insuring perfect fit to gum and gaining additional strength for bridge.

Second case. A new bridge, the swung in or dummy teeth being untipped porcelain also, but with this difference. No gold showing except in interdental spaces, buccal grinding and lingual surfaces being all porcelain. Made as follows: Use the "Bing" tooth, a four pin tooth having two pins on each approximal surface. Put on backing, allowing them to come to lowest point of tooth next the gum line.

Swage gold or platinum to ridge and grind tooth to fit; when set on gold swaged to gum ends of backing rest on gold. Solder backing to saddle and fill interdental spaces and finish. When set no gold shows except interdental spaces.

CLINIC NO. 49.

Dr. Henry Barnes and Dr. L. P. Bethel were prevented from being present.

CLINIC NO. 50.

MICROSCOPICAL EXHIBIT. BY DR. J. PRENDERGAST, CHICAGO.

The following microscopical specimens were shown :

1. Longitudinal section of dentinal tubules.
2. Cross section of dentinal tubules.
3. Section of enamel.
4. Section of tongue, showing the muscular fibers running in different directions and papillæ.
5. Section of stomach, showing rugæ, tubular glands and columnar epithelium.
6. Section of small intestine, showing valvulæ conniventes, villi, tubular glands of Lieberkuhn and columnar epithelium.
7. Section of lung, showing bronchioles, infundibula and air sacs.
8. Section of infected lung, showing capillary net works surrounding the air sacs.
9. Section of kidney showing Malpighian bodies. Uriniferous tubules convoluted and straight and pyramids.
10. Section of infected kidney, showing blood supply to cortex and medulla.
11. Longitudinal section of voluntary muscle, showing striated fibers and their nuclei.
12. Cross section of voluntary muscle fibers, showing position of nuclei immediately beneath sarcolemma.
13. Section of heart, showing branching fibers.
14. Cross section of nerve trunk, showing arrangement of fibres in bundles, also axis cylinders of nerve fibers.
15. Section of cirrhotic liver, showing increase of connective tissue and atrophy of liver cells.
16. Section of lung, showing air sacs filled with small round cells.
17. Section of nutmeg liver, showing deposit of pigment in center of lobules and atrophy of cells.
18. Section of carcinoma of tongue, showing nests of cancer cells and connective tissue stroma.

CLINIC NO. 51.

HOT AIR A FAILURE IN DESICCATING ROOT CANALS PRIOR TO FILLING.

BY DR. J. H. WOOLLEY, CHICAGO.

We have all come to this conclusion, that in the proper treatment of devitalized teeth three things are essential: cleanliness,

proper antiseptic dressing and freedom from moisture in pulp canals before filling. The special point I wish to make to-day is to prove that hot air alone is a failure in desiccating pulp canals. After placing the cofferdam around the tooth we will proceed to pass a current of hot air into the pulp chamber for from ten to fifteen minutes, after which we shall use the root canal drier, passing the heated brooch into the canal through its entire length. We shall then hear a hissing sound, the result of the heated brooch coming in contact with the moisture left in the pulp canal, which the hot air was not able wholly to remove. Proceeding further we shall lubricate the canal with eucalyptus, which can afterward be absorbed away with cotton. The test which we wish to demonstrate is the complete desiccation of both the canal and the tubules. An antiseptic dressing, like eucalyptus, has the effect of embalming both root and tubules; enough of the medicine will remain to destroy possible microorganisms left in the canal, and the entire operation is thus rendered more safe and satisfactory.

REPORT ON SAME BY DR. REID.

Dr. Woolley's operation on the second bicuspid treated according to his advertised clinic proved that hot air alone failed in desiccating the pulp canal and tubules. The root was filled afterward by Dr. Reid.

CLINIC NO. 52.

CROWNING DECIDUOUS TEETH, FOR MISS CHRISTINE SHRYOCK, AGE FIVE YEARS. BY DR. W. W. SHRYOCK, FORT WAYNE, IND.

The four incisors were crowned November 1, 1893, she then being twenty-three months old, the right central was removed to make a clinic of the case at this meeting.

The little root was prepared in the first place, by removing decay, and roughening the labial and lingual sides, the cavities needed no retaining pits, as they were deeper in center than at cutting edge, so that when the crown was roughened, and partially filled with cement, the pits and cavities in root filled the same, the crown being pushed to place, holding firmly.

The root having been prepared as above, with a piece of binding wire, the size of root was taken, a piece of pure gold rolled to 32, U. S. Gauge, was cut according to measurement, lower width being a little less than top, to form contour, the piece brought together, and soldered at top only, with coin gold.

The band was then placed upon the root and fitted, to gum and root, the labial side being lapped over and burnished, the cutting edge brought partially over, the band removed, a little cut out at each corner, replaced and burnished, removed, and coin gold flowed over the whole crown to strengthen and give better color, finished, and set with cement.

Master Bartlett Shryock's superior centrals were then examined and found to be in as good condition as when shown at the Illinois State Dental Society meeting at Springfield in May, 1894, at which time they were put on record with his sister's, as being the first cases of the kind to that date, having been set on February 8, 1893.

CLINIC NO. 53.

ATTACHMENT OF ONE END OF A SMALL BRIDGE, SUPPORTING ONE DUMMY. BY DR. GEORGE B. PERRY, CHICAGO.

A palatal plate is made for one tooth and a flat bar carried across the space to the next tooth, having previously been soldered to the plate, which contains a pin taken from a plain tooth that has been fitted into a cavity made in the natural tooth. The other end of the bar is split, one portion being fitted to a groove in the natural tooth and carried up under the cervical margin, the other so shaped that it goes down and nearly across the fissure. The position in the mouth with which I have had experience has been in the upper jaw from cuspid to second bicuspid, swinging in a facing on the bar. Its points of advantage are four—showing little or no gold, preventing the teeth from spreading, holding the facing rigidly so it will not be pressed upward, and preventing a rotating movement of the bar.

CLINIC NO. 54.

REPLANTATION. BY DR. LOUIS OTTOFY, CHICAGO.

The case was a boy thirteen years of age. About six months ago he was accidentally struck with a base-ball bat, fracturing the right superior central incisor distal angle, also the right superior lateral incisor, which was fractured below the gum line, partially splitting the root.

The central incisor was restored with a gold filling, the remainder of the root of the lateral incisor was removed about four days ago. This root, it was found, could be utilized, and a Logan crown was attached to it, the joint between the two being filled with gold. An impression of the upper and lower teeth of the re-

gion was then taken, casts made; the tooth to be implanted was placed in proper position in the cast, the articulation perfected, and with Mellotte's compound an impression of the tooth to be implanted, and of its two neighbors were taken, and a small platinum cap struck up, to fit over the cuspid and central incisors snugly, but loosely over the tooth to be transplanted, merely forming a shield for its protection. Several days were then allowed to elapse; that is, until the retrograde metamorphosis following the extraction of the root was succeeded by the deposition of new cells, with a view of the partial filling up of the socket, which always follows the removal of the teeth from the alveoli. The tooth is then placed in euthymol, or any other suitable nonirritant germicide, until ready for use.

When the tooth is to be planted the patient is seated in an adjoining room with the instruction to gradually force it into position. It took this boy forty-five minutes to get the tooth into place without causing himself any pain. The socket is thoroughly syringed with the same preparation, the tooth placed under careful antiseptic precautions, into position, and the previously prepared cap cemented to the adjoining teeth. In about two weeks the cap is removed, but preserved, and if sufficient attachment has taken place, and the articulation is such that there is no danger of misplacement, no further need of the cap exists; but sometimes it must be replaced for periods varying from two to six weeks longer. Within two months, as a rule, the tooth has become sufficiently firm to need no further support.

CLINIC NO. 55.

FORMATION OF CAVITIES IN PORCELAIN TEETH. BY DR. G. W. WHITEFIELD, OF EVANSTON, ILL.

Forming cavities in porcelain teeth applicable for crown and bridge work, to make the porcelain teeth harmonize with the natural teeth in the mouth.—Often a perfectly formed porcelain tooth, either on a plate or as a crown, is inserted in a mouth where all the natural teeth show fillings, thus stamping it at a glance as false.

By forming a small cavity in the side and filling with gold, cement or amalgam, the harmony in the mouth is retained.

Dr. Whitefield demonstrated how these cavities may be cut with plain copper points corresponding to a No. 9 oval bur, and a No. 3 thin wheel bur to form the undercuts.

These points dipped in oil and diamond dust cut freely and rapidly. Cavities may be formed to harmonize with any case. Carborundum can be used in place of diamond dust, but is not as satisfactory.

Add a little salicylic acid to a solution of gum cassia to prevent fermentation. Keep this in the office to apply. Three or four coats of this varnish applied to the underside of saddle bridges and the outside of bands of crowns will, when it dissolves out, positively free all adhering portions of cement—they will work out from under the bridge.

CLINIC NO. 56.

STERILIZING PUTRID CONTENTS OF PULP CANALS. BY DR. C. H. ROSENTHAL, OF CINCINNATI.

Sterilizing putrid pulp canals by electro decomposition.—His method was producing nascent chlorine and driving the same through the pulp canal from positive to negative by osmosis, this was done by placing a saturated solution of sodium chloride on a piece of cotton and attached to the positive pole, which upon contact eliminated large quantities of free chlorine. The antiseptic qualities of the chlorine together with the decomposing effect of the galvanic current, he claimed, renders these septic pulp canals perfectly aseptic and ready for immediate root fillings before removing the rubber dam, claiming it advantageous to do so to obviate the possibility of regenerating the pulp canal by contact with the saliva that contains ever present germs. The canals were filled in the following manner: A piece of orangewood was whittled down to the size of the pulp canal, the wood then saturated with a double strength tincture of iodine and a paste of iodoform and glycerine was then placed on the stick and carried to the pulp canal and applied with a churning motion, the stick was broken off and left in the pulp canal, the tooth was then ready for filling.

EXHIBITS.

EXHIBIT NO. 1.

ENAMEL RESTORER. BY S. B. BROWN, FT. WAYNE, IND.*

A metallic oxide for restoring polished surfaces on the natural teeth, where the enamel is defective, grind out the superficial de-

* Deceased.

fects, smooth the surface with Arkansas stone, then use the enamel restorer, with water and moose hide point. Ground surfaces on artificial teeth are polished in the same manner.

EXHIBIT NO. 2.

REMOVABLE PORCELAIN BRIDGE. BY DR. W. G. CLARK, CEDAR RAPIDS, IOWA.

The removable bridge or skeleton plate is made to replace the two bicuspids and first molars on each side of the jaw. The second molars on each side are crowned with gold—a band of iridio-platinum is made to telescope them; a narrow saddle of platinum is swaged to fit the alveolar ridge. Iridio-platinum wire, 15 gauge, is cut in pieces long enough to be bent around each of the front teeth at the cervical margins on the palatal side; these being soldered together with pure gold; the one surrounding cuspids being extended across and clasps about molars.

The saddle is soldered to clasp at one end and the wire at the other.

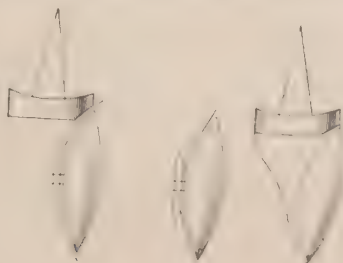
The teeth are ground to fit, waxed in place, invested, and pins soldered to wire with pure gold. Porcelain body is placed about teeth contoured to suit, and baked.

Gum enamel may be used on parts where its use would be suggested.

EXHIBIT NO. 3.

PARTS OF CROWNS IN DIFFERENT STAGES OF CONSTRUCTION. BY DR. L. W. LYON, ST. PAUL, MINN.

The following points were illustrated by this exhibit: Grind the tooth at similar angles, cutting edge as well as gingival. Back with pure gold, burnishing over both ends; notch pins, then place another small plate of gold, of similar thickness, half the length and close down the pins, paying no attention to the joint, but only to the length. Have the gold backing come in contact with the



outside edge of the band; then fasten with wax cement, invest, remove wax, cleanse thoroughly, then put a small amount of 20k. solder, cut in small pieces. Place into the Custer electric furnace, heat up slowly to a proper degree, then remove it, and, with a blow-pipe complete the operation, adding solder until done; cool slowly and finish, and the result is a very satisfactory joint.

EXHIBIT NO. 4.

AN OPEN IMPRESSION CUP (UPPER AND LOWER) FOR PARTIAL CASES.
BY DR. T. G. WONDERLY, GALENA, ILL.

The openings are filled in with sectional pieces so arranged that the openings can be made just where needed, allowing the teeth remaining in the mouth to pass through said openings.

EXHIBIT NO. 5.

FULL UPPER PORCELAIN BRIDGE. BY DR. GEO. W. SCHWARTZ, CHICAGO.

Dr. Geo. W. Schwartz exhibited in the mouth of Dr. H. A. Cross a full upper bridge of porcelain, saddled on gums, having six abutments, viz.: two molars and four bicuspid; also in the same mouth right lower porcelain saddle bridge of five teeth, having two abutments, viz.: one molar and bicuspid.

EXHIBIT NO. 6.

OFFICE CONVENIENCES. BY DR. G. V. BLACK, OF JACKSONVILLE, ILL.

Dr. Black exhibited a unique sterilizer and warm water heater by means of which water can be kept at an exact even temperature.

EXHIBIT NO. 7.

APPLIANCE FOR HOLDING BACK THE RUBBER DAM AT THE ANGLE OF THE MOUTH DURING OPERATIONS. BY DR. C. N. TROMPEN, CHICAGO.

The dam holder consists of a wire about four and a half or five inches long, slightly curved, with the ends enlarged and rounded, and a short piece of wire about one-fourth of an inch in length soldered at right angles to the outer curve of the wire, midway from the ends. Having the dam adjusted over either upper or lower bicuspid or molars, the upper and lower corners of the rubber are stretched over the ends of the wire, so as to draw it tight. The rubber is then stretched in the middle over the attached piece.

This will hold the rubber out of the way and exposes the tooth to be operated on to full view, and prevents the rubber from being drawn into the mouth.

EXHIBIT NO. 8.

GOLD AND TIN COMBINATION FILLING, SHOWING THE UNION OF THE TWO METALS. BY DR. E. T. SHUMWAY, PLYMOUTH, MASS.

The base of these fillings are made of No. 4 tin foil put in, in the ordinary way with hand pluggers. The outside is extra cohesive gold foil, varying from No. 4 to 40. The gold is manipulated with a nonmetallic instrument, and is made to adhere to the tin by affinity. No pressure or force is applied to secure a union, neither is there any interlacing or incorporating of the gold with the tin—no preparation, such as resin or gum varnish, but simple contact. The union takes place insensibly like the uniting of two drops of water. A smooth, not a rough, surface for the tin makes the union more complete. No burnisher is applied to the surface after the filling is finished, as burnishing crystallizes the gold and impairs the union.

The value of tin as a filling material has long been recognized by the dental profession. All the preservative qualities of the tin are secured by this method, while the gold protects the tin from oxidization, and secures to the filling all the valuable qualities that gold is known to possess.

What changes take place in the tin when the gold is brought in contact by the method described, I do not know. It appears from my observation and experience to be a chemical change which makes the union possible. All I know is that it is easily done. The longer the filling remains in the mouth the more complete and perfect the union seems to be.

It is equally adapted to the incisors as the bicuspid and molars, as the tin unless oxidized is colorless, it does not show through, and the effect is that of a filling made entirely of gold. This I have tested both on proximal and labial surfaces; these fillings have been in several months, a sufficient length of time, when the susceptibility of tin to change is considered, to determine with some degree of certainty.

I submit these specimens to the examination of your society, believing it involves a principle of great value to the dental profession. I trust it will excite sufficient interest to stimulate a further examination. Not alone will the patient be benefited, but it lightens the burdens of those who have to perform operations upon the teeth.

I wish to add that the tin is put in without regard to quantity, only that it shall be sufficient to extend to the periphery of the dentine; it is then trimmed with an excavator.

EXHIBIT NO. 9.

NEW APPOINTMENT AND DAY BOOK FOR DENTISTS. BY DR. GEO. E. ZINN,
CHICAGO.

This is a book designed to take the place of the appointment book, the day book, the diagrammed ledger and the cash book.

It is unique in form, showing when laid open, space and diagrams for one week's work, followed by a space for addresses, remarks, etc.

Each day's space contains a diagram of the several surfaces of the teeth for the proper location of work done, also space for designating the kind of work done, the charges, amount paid, etc.

With this a dentist has a record of appointments, and by so marking broken appointments may know why they were not kept.

It is a complete year book of appointments, broken or kept, of work done, location of same, charge, income and expense, with supplementary notes on complicated or rare operations.

It makes the most complete, compact and concise file of a dentist's work and accounts that can be kept, and the most handy for future reference.

It is necessary to post the debits and credits into a general ledger, only to keep the aggregates of the account for future references.

This may be done in an ordinary double-column blank book or an Allport ledger. For those who choose an Allport ledger the posting can be done by an assistant with no chance of mistake.

EXHIBIT NO. 10.

RUBBER DAM HOLDER WITH ELECTRODE ATTACHMENT FOR CATAPHORESIS
BY DR. CHAS. K. VAN VLECK, HUDSON, N. Y.

This rubber dam holder is so arranged that the elastics can be so fastened as to permit the holder to accommodate itself to the shape of the head, without "drawing" at any particular point.

It also has a set screw fastened in the holder in such a manner that the negative pole of the electrode during the application of cataphoresis can be attached to it.

EXHIBIT NO. 11.

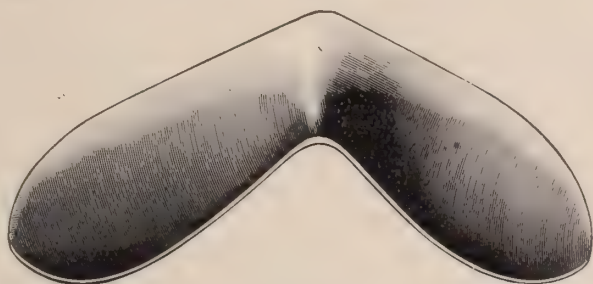
CHEEK HOLDER AND SHIELD. BY J. AUSTIN DUNN, CHICAGO.

Feeling that there was a need of something to protect the mouth from unnecessary injury in the use of disks, corundum, stones, etc., the writer some two years since designed a cheek holder for the purpose, but it was not in all respects satisfactory.

Subsequent efforts have resulted in producing a shield much more suitable and convenient.

The shield as illustrated is a triangle in shape with convexo-concave surfaces. The direction of the two wings is such that when held in position by the left hand the light is not obstructed, and it is out of the way when manipulating.

It is the opposite of the handle of a mouth mirror, for it engages and widens the angle of the mouth and carries it back.



The convex surface allows it to be moved into almost any position without impinging on the soft tissues, and causing discomfort to the patient.

It is made of aluminum, which makes it light in weight and easily cleaned.

It is to be used to protect and shield the cheek when finishing fillings with disk or grinding down the posterior teeth with large corundum wheels, also when finishing fillings before the rubber dam is removed.

For examination and operating on all of the posterior teeth, especially the buccal surfaces, the view obtained by virtue of the widening of the angle of the mouth and carrying it back will be an agreeable surprise to many.

The additional word "shield" is very appropriate, and credit is due Dr. B. Holly Smith, of Baltimore, for the suggestion.

EXHIBIT NO. 12.

SHELL CROWN CARRIER, BY DR. C. H. ROSENTHAL, OF CINCINNATI.

A device for carrying shell crowns after finished and ready to set. It consists of a piece of orangewood with beeswax waxed to one end. Stick crown to wax, carry conveniently to any part of mouth.

CHICAGO DENTAL SOCIETY.

Anniversary clinic and meeting, February 1-2, 1897. February 2, 1897, Afternoon Session, the President, Dr. Louis Ottofy, in the chair.

Dr. I. P. Wilson, of Burlington, Iowa, read a paper entitled "Three Pathological Cases."* See page 152, March number.

The president asked Dr. Crouse to open the discussion.

Dr. J. N. CROUSE: I was just thinking, while the doctor was reading his paper, of the efforts that have been made by the dental profession to make it a branch of the medical profession, and after listening to the paper I thought it would be a good idea for some one to offer a resolution to the effect that it is the sense of this meeting that the medical profession ought to be a branch of the dental profession. If I understand, in the first two cases reported by the doctor no dentist was called in. Many intelligent physicians know enough to call in a dentist sometimes to diagnose a case for them, particularly when the case belongs to us. I find some dentists who want to join medical associations, and after that they are too smart to be dentists, and still they do not help the medical profession very much.

Dr. C. R. TAYLOR, Streator, Ill.: I would say in reference to the remarks of Dr. Crouse regarding the medical profession that physicians are beginning to recognize the qualifications and ability of dentists, and I want to say in our behalf that one of the finest speeches that I have ever heard was made by Dr. Moyer, of Chicago, not long ago in which he stated in the clearest and finest terms that the dental profession to-day was standing in the lead of all the specialties in medicine. He eulogized the dental profession, and so far as my experience has been in my own community, physicians gladly call upon dentists for help and to assist them in making diagnoses in the specialty in which they feel that they have not been qualified for. (Applause.)

Dr. G. V. BLACK: I will say just one word, and that is in ref-

erence to diagnosis in these cases. Perhaps we have no disease to contend with in which the value of very early diagnosis is so great as in carcinoma. If the case has gone on until we have infiltration of glands and swellings occurring at more or less distance from the seat of trouble, the case is almost hopeless. The next thing is a coffin. In order to treat these cases successfully with the knife it is necessary that we know early the character of the disease, and it is often extremely difficult, if not impossible, to know by ordinary clinical observation. We must bring the microscope into play, and this must be done by some one who is experienced not only in histology, but who is familiar with the pathological conditions that are indicative of, or characteristic of this disease. Only this morning I have been consulted by mail in a case of this kind where the surgeon in charge was in some doubt. It is a case of suspected cancer of the rectum where there was simply one point in the section sent me which showed very strikingly the existence of cancer, that is, an enormous number of karyokinetic figures in the epithelial cells were visible, showing a rapid multiplication of cells in this tissue. Now, an operation needs to be done very early, before there is infiltration of glands and tissues with these abnormal conditions. If it is not performed early it is almost useless. Any tumor that is suspected of being of a cancerous nature should have a clipping made of it at once and examined microscopically. Take cancer of the lip, cancer of the tongue, or cancer in any of those parts, and we know that cancers occurring about the mouth are as frequent as cancers of the whole body besides. This work is in our field. The majority of all cases of cancer that occur take place in our field of work. Therefore they are of especial interest to us as dentists, whether we operate or not. We are liable to see them first, and an early, careful microscopic examination should be made:

Dr. WILSON (closing the discussion): It is unnecessary for me to add anything to what has been said. I want to endorse the remarks of Dr. Taylor and to say that it is the spirit which largely prevails throughout my own town, and the cases I have reported occurred away from my town but finally came there. The London case is certainly inexcusable, as no dentist was called and the whole trouble was in the tooth. A distinguished surgeon had charge of the case, but no attention was directed to the tooth, poultices being applied on the outside.

Dr. GEORGE F. CHENEY, of St. Johnsbury, Vt., read a paper, entitled, "Sensitive Dentine."*

Dr. G. V. I. BROWN, of Duluth, Minn., was called upon to open the discussion. He said:

The Doctor's paper is most opportune. Never in the history of both medicine and dentistry has so much attention been directed to the relief of pain as there is at the present time.

I think this subject can be divided and properly discussed under four heads, viz.:

First, the histological aspect of the subject.

Second, the mechanical,

Third, the chemical.

Fourth, the mental or nervous.

So far as the first consideration is concerned, I think it would hardly be fair for one who is only a layman in histology, and who is dependent upon what other people do, for information, to take up your attention at this time. When Drs. Bödecker, Andrews, Black and others have such widely different views concerning the structure of dentine, I do not think it necessary for me to talk to you about it, and I think the answers given to the question have fairly demonstrated that even among the greatest thinkers there is a wide diversity of opinion as to dentine and what it contains. Therefore, I will dismiss that part of the subject without further reference.

The next, the mechanical part of the subject, concerns every one of us; it is important to know that we can by some means of careful manipulation and delicacy of touch make the pain of our patient less; that a bur applied to a sensitive part of a tooth from one direction may be extremely painful, and by an almost imperceptible alteration of its direction the painful sensation may be abolished, and I believe that too much stress cannot be laid upon the importance of sharp-edged instruments and manual training, which would enable the operator to overcome in the highest degree the painful penalty of unskillfulness.

So far as the chemical aspect is concerned, under which I would class the treatment of sensitive dentine, with the various preparations—drugs—I have one thing particularly to say, and that is: let us be very careful how we interfere with nature. I do not mean this in the sense which objection was raised long ago, at

*See page 99, February DENTAL REVIEW.

the time of the introduction of general anæsthesia, and they called it "flying in the face of Providence," but on purely physiological grounds, for which I will give my reasons shortly.

There seems to be a difference of opinion in the answers to the essayist's questions as to irritation and inflammation. I do not think it affects us very materially so far as the excavation of sensitive teeth is concerned. When he asks, "what makes dentine sensitive?" we must necessarily go back a little further and ask, "what makes pain?" because there is a true basis upon which the matter must rest.

What is pain? Pain, as I understand it, is nature's signal that something is wrong, and I think that more and more we are getting to regard pain just as medical men are getting to regard fever, not as something which wants to be treated so much in itself as to get at something which will remove the cause of it.

I do not think, in typhoid and other fevers, they are giving the remedies to-day that they used to, with the particular idea of decreasing the heart's action and of reducing temperature. Physicians are learning that they need the heart action they have interfered with in combating the effects of the toxins, and we may need the vitality of the tooth that we have destroyed in an effort to reduce painful sensation.

It concerns us how pain is transmitted to the brain. We locate that as the place from which the knowledge of sensitiveness occurs. There are some eminent men who claim that each cell does thinking for itself; there are others who claim that these sensations must be transmitted to the centers of the brain in order to have the consciousness of it.

I believe thoroughly in the transmission of nerve sensations by wave motions, just as light and heat and sound are transmitted. If you believe that as I do, you must believe that under certain conditions these wave motions will be rapid and intense. You will have this sensation felt more quickly and keenly just as when you tighten violin strings you have a more intense pitch, a high sound and rapid vibration.

When you loosen the strings the vibrations are less rapid; the sound is lower in pitch, it is less intense. I think I can demonstrate clinically that this is particularly true so far as our treatment of patients is concerned in dentistry. In seeking to know the cause of sensitive dentine, one must consider all these things. The

secretions of the mouth cause irritation and cavities that have recently been filled with these secretions are apt to be more sensitive than those that have been filled temporarily, and for this reason it has long been my practice, as early as possible after receiving a patient, to go over the mouth and fill all of the cavities easily accessible with gutta-percha.

By means of this temporary stopping I remove the danger of the case getting worse and complications of any kind arising through inflammation of the pulp, or otherwise in the event of operations being delayed by unforeseen circumstances and also by excluding the secretions of the mouth relieve much of the sensitiveness which I would otherwise encounter in the excavation of these cavities in permanently filling later on, besides which, I also believe there is less danger of recurrence of decay under the permanent fillings when they are inserted.

There are other conditions which have an indirect influence that must not be overlooked. The same condition in different patients will vary. When we have cold weather in Duluth, the thermometer indicating twenty degrees or more below zero, I never undertake to excavate a sensitive cavity for a nervous patient if it can be avoided, because I have repeatedly demonstrated that I can take the same patient with the same cavity on another day and excavate the cavity without any trouble and without the application of any drugs. Believing that to be true, I go another step. There is no reason then why any quieting influence will not reduce the sensitiveness of dentine. In other words, I try to quiet my patient by relaxing those nerve strings, if you will permit me to call them such, as much as possible, and before I come to that I want to go back now to what I believe to be a danger in applications to the tooth cavity. I believe that when you interfere with the sensitiveness of dentine beyond a certain point (I do not mean anything immoderate) you are destroying to some extent the vitality of the part. Inasmuch as this living activity is interfered with, just in that proportion have you increased the possibility of a pulp dying under the filling, or of some less striking, but quite as troublesome pathological change in the structure of that pulp later on.

As to whether dentine is sensitive when it is not irritated or inflamed, I do not see how anybody can demonstrate that. How can you tell whether dentine is sensitive or not, unless you irritate

it? Granting that there is irritation present and following along the line of thought, you can readily understand why I am opposed to the use of a good many methods that are commonly recommended for reducing sensitive dentine. A number of dentists look upon coagulants as being at a disadvantage, in that they do not penetrate deeply. If you can affect the surface and be sure the coagulant will not go deeply into the dentine and accomplish results by repeated applications, it is an advantage. Something of that kind can be safely used.

I have had occasion to treat neuralgia of the head and face of patients who were suffering from reflex disturbances which had affected them in a general way, patients who had been the inmates of water cure and other establishments, and I am convinced that in many of the people to-day, who are chronic sufferers wandering about this and other countries in search of relief, the trouble lies more frequently in the mouth than we have any recognition of, not necessarily in the neglect of the teeth themselves, in abscess of the teeth or in diseased teeth that have dead pulps, but in those teeth the cavities of which have been filled and the metal has irritated the pulps so gradually that it has not caused a violent upheaval, but has brought about a condition there which has resulted in either chronic inflammation of the pulp, or of the sheath of some of the nerves which lead to the pulp or from it. We report those cases in our meetings as all right; we do not know that there is anything the matter with them. I have frequently bored into teeth which seemed to be all right, where destruction of the pulp has given relief, yet until this was done there was no actual demonstration that some one had blundered. This brings us to the present fad—cataphoresis.

There is at present a great stir being made about cataphoresis. It was briefly mentioned in the paper, therefore I suppose it legitimately comes up for discussion. I would say to you, be careful of cataphoresis. Be careful how you use anything that will cause too deep a penetration and too much of an effect locally. I do not think it is the place to get the effect. I do not think we fully understand what it means. To have such a method distributed promiscuously among people—I won't say ignorant men, because that would not follow, but men who are too busy to make a study of its nature and effects—and have it indiscriminately used by members of the profession with the chief object in view of

filling teeth without causing pain, and whenever that, consider it a success, is liable to bring great discredit upon the profession. Since I have been here I have been hourly expecting to receive a telegram calling me home to a case in which I was recently called in consultation. A man had to have a crown removed on account of the tooth giving some disturbance. Cocaine was used, as well as in the cataphoretic current around the gum of the tooth for half an hour. This happened between two and three o'clock in the afternoon. That night, when the physician was called in, the submaxillary and sublingual glands were found to be swelling rapidly; the man's tongue was turned back in his mouth to such an extent that he nearly died from suffocation. Since then all of that covering of that portion of the jaw which was acted upon by the current had given away, not only the gum tissue, but the periosteum, and he now has a badly sloughing mouth in spite of the antiseptics we used, with about a half to an inch of his jaw exposed without periosteum. It is difficult to tell just what the outcome will be in his case. While it does not necessarily follow that cataphoresis will do this, yet it is enough to make us stop and think about it.

The question is, what can we do legitimately to quiet sensitive patients? I think I can excavate the cavity of any tooth in a sensitive patient that can be excavated by the use of cataphoresis by the plan I propose to briefly outline. I will do it simply by an effect upon the patient, not necessarily by my personal effect. For instance, I would hold my mouth mirror before the patient, tell her to fix her eyes on it and to take some long breaths. Do not mix me up with hypnotism. You can disordinate the state of the patient's mind by so doing; in other words, in coördination you depend upon the sensation from the tooth to be transmitted to the brain to give the consciousness of that pain and what it is. Anything which disarranges that, which causes even temporarily its retention, will prevent the patient from suffering pain incident to the filling of the cavity.

I have, as doubtless all of you do, very nervous patients under my care from time to time. I recall one who was under the care of Dr. Weir Mitchell for a long time. When she came to my office she would fly all to pieces, so to speak; she would become hysterical, tears would run down her face without my doing anything. The mere thought of operating on her, at first would cause this condition. Now, this patient sits in my chair, takes long breaths;

I quiet her, go about my other affairs, wash my hands and do anything I have to do, and when I return to her I find her very much rested in mind, and I can proceed to work upon her teeth with some degree of safety and comfort.

Dr. CLIFFORD: Do you know anything about the strength of solutions that were used in the case you mentioned?

Dr. BROWN: I have no data. I presume they were used in strengths according to the methods ordinarily recommended.

Dr. CLIFFORD: You have no definite information in regard to the case to which you have referred?

Dr. BROWN: I look upon the information I secured in this case as somewhat unreliable; it is hard to get reliable information when a man's patient has nearly died on his hands, and I was a little cautious about trying to know too much, fearing that I might be called upon to testify in the case.

Dr. CRAWFORD: How long had the patient worn the crown before cataphoresis was used?

Dr. BROWN: I do not know.

I want to say a word in reply to the remarks of Dr. Crouse, and I regret that he has left the room. I do not like to have it go out from this society, as the concensus of opinion at such a great meeting that there is any such feeling on the part of the medical profession toward us as mentioned by Dr. Crouse. I find that medical men are even more interested in this fertile field that lies between medicine and dentistry than are the dentists. The greatest encouragement I receive comes from medical men, notwithstanding I have no fault to find with the dentists; I find they seek papers on the subject. I would like to say right here that you have got a man in the city of Chicago who has done greater work for us than any other man, with the exception of Drs. Black and Miller. I refer to Dr. Turck, whose practice is limited to diseases of the stomach. I have long been satisfied, from my clinical experience, that diseases of the mouth are frequently excitants of diseases of the stomach and digestive tract, and that infection from the mouth was one of the great dangers to be combated by physicians in the treatment of many diseases.

Dr. Turck's experiments in having taken cultures from the mouths, and also from the stomach, in given cases, have shown conclusively the same bacterial conditions to be present, and have demonstrated beyond the shadow of a doubt the truth of certain

facts that we as dentists know in a manner, but which could never have been done so completely by any one else, save a physician, or so calculated to force proper recognition of the subject among physicians.

Dr. A. H. THOMPSON, Topeka, Kan.: I am very much interested in the subject of sensitive dentine. From a practical standpoint, I have a system of treatment which is perhaps old fashioned, but which is effective, and which in my practice I have found to be the best one that could be pursued. I will give you a little of my theory. Dentine, as you know, is closely allied to bone in its structure, in both the organic and inorganic elements. The substance of the dentinal tubuli is the same as the substance contained in the canaliculi of bone, and that is more or less simple protoplasm which serves the purpose of the osmotic conveyance of matter and waste; so that I heartily approve of Dr. Brown's ideas that we should not use too strong remedies without going back to the cause and reaching it systematically, if possible. Therefore, I treat teeth locally, not by immediate methods for destroying sensitive dentine, but by gradual methods of temporary fillings, to which Dr. Brown has referred, except that I nowadays use oxyphosphates. In my early practice I used oxychlorides to some extent. That also illustrates the point which Br. Brown made as regards the danger of local irritants. We have trouble with oxychlorides in cavities from the irritative effects of the pulp. As he has well said, local irritants are dangerous in that way. I consider oxyphosphates are the ideal material for this purpose, and my method in practice is to treat sensitive cavities with oxyphosphate fillings until the sensitiveness is reduced before operating, not only for the reduction of the sensitiveness, but also for a given time in order to effect the restoration to a healthy condition the contents of the tubuli. I believe all immediate methods are dangerous in that they do not give time for restoration to a healthy condition of the contents, and these may go on and give subsequent trouble, as they do in sensitive fillings sometimes, resulting in death of the pulp. If the irritable condition is reduced by temporary treatment in this way we are liable to have less trouble afterward. I have used temporary fillings for years more than any other fillings.

Dr. CUSTER: I have demonstrated and spoken of the accidents that may occur from the use of an Edison or 110-volt com-

mercial current, but in the application of cataphoresis for the treatment of sensitive dentine I have had very little experience, but I should say there is a possibility of the patient receiving a shock unless the operator is careful. The result of an Edison current of fifty or sixty volts which you would get through your cuspidor or short circuit would be nothing more than a severe shock to the patient.

As to the use of cataphoresis for the treatment of sensitive dentine, I do not think there is an operation in dentistry that requires a broader knowledge and a more careful exercise of all the faculties we have and of the instruments and appliances than that of cataphoresis. You have got to know something about electricity; you have got to know something about physics, as well as of the complicated appliances which are necessary in the management of this agent, and all these taken together, we must understand that to produce cataphoresis painlessly is a difficult thing. The fundamental principles upon which cataphoresis depends you are all familiar with. I call attention here to one point. It is the fibrillæ contained within the tubuli of the dentine which we endeavor to anæsthetize, consequently it is not that area of dentine which is exposed to the solution which will be anæsthetized, unless you go into the pulp, anæsthetize it and come out laterally through the neighboring tubuli which have not been affected by it. Enamel is as much a nonconductor as so much porcelain. It is difficult to anæsthetize labial or saucer shaped cavities. Right here cataphoresis has not been an entire success. The points which you will strike with an excavator or bur to deepen, to reach out laterally, will not be anæsthetized unless you have gone to the pulp and come back again.

As to the dangers from the Edison current, if you have a fountain cuspidor and it is attached to the floor, if the patient happens to strike it with the hand he will get a shock. The other electrical instruments, at the same time you are applying cataphoresis, must be watched. If you are using an eighth horse power motor, and your assistant shuts off the current in the laboratory, there will be an increase of so many volts pressure and the patient will get a shock from that. If you are in a large office building in which you are getting your current and there are large motors and the light is shut off and turned on during the daytime, it is better for you not to use that current. In those places where you cannot get

a current direct from the main line it is better to operate a battery. The dry battery has not proved a success on account of the uncertainty and rapid decline in the amperage of the cell. I would recommend that which you would use for telephone purposes. It is an open circuit cell, carbon, zinc and sal ammoniac. It is one which gives me better satisfaction than any form of storage cell.

Dr. CLIFFORD: Dr. Custer has spoken of the disappointment we have received in our efforts to prepare buccal and other cavities painlessly. I want to ask him if in the application of cataphoresis to these cavities there is any possibility of danger to the soft tissue contiguous to them, and if so, what are those dangers? For instance, the gum might be touched. What would be the pathological condition that would follow any unfortunate application of the current?

Dr. CUSTER: Danger might occur from leakage of the current, but if you are using any instrument you can detect that and there is no occasion for the loss of current in that way. The amount of current used would not produce any bad results.

Dr. CLIFFORD: Have you ever seen sloughing following cataphoresis?

Dr. CUSTER: None.

Dr. CLIFFORD: How strong a solution do you use on the gum?

Dr. CUSTER: I use a saturated solution. In the case referred to by Dr. Brown I should say the long application (thirty minutes) of the current might have produced the trouble he speaks of. It seems to me, with a high voltage the application ought not to be longer than five or ten minutes.

Dr. C. R. TAYLOR, Streator, Ill.: With reference to cataphoresis there are many persons experimenting with electricity who know very little about it. Too many dollars are spent on things we know nothing about and less on those things that we do know something about. I am of the opinion from an experience extending over twenty years, that if we spent more money in keeping our excavators and other instruments sharp, we would produce 100 per cent less pain for patients than we inflict upon them now.

I was impressed with the remarks of Dr. Brown when he referred to the high strung, tense condition of some patients that come to our office. We have all had patients sit in our operating chairs with their muscles intensely rigid. Such patients are in no

condition to be treated or attended to at that time. It is the duty of each one of us to be so sympathetic in our attitude in relation to our patients that we can in a measure assist them to help themselves out of that state of mind. It seems to me, there are three conditions arising from sensitive dentine. First, irritation from outside causes; second, inflammation, and then the last stage, which is the worst, the damnation that comes from our patients. That is about the state of their mind anyway if they do not express it; some of them are not too impolite to express their mental condition. I will say to the younger men of the profession—although they may know more about electricity than the older ones—spend more money to keep your instruments sharp, and study the relation of the patient to yourself and yourself to the patient, and you will have a great deal less trouble to contend with.

Dr. RICHARDS, of Knoxville, Tenn.: The matter of handling the current in cataphoresis is important to all of us who use it. In the remarks that have been made this afternoon I have noticed some difficulty on the part of the members in finding a suitable current for their cases, and I have endeavored to secure something that would act as an insulator. Several of the modes that are now prevailing have been ineffectual in my hands, and to overcome them I have constructed some tubing. I did not come here with the expectation of showing it at this time, but expected to do so in the clinic room. As I have it here it will give you an idea of the manner in which I use it. The whole thing is embraced in what you see here. I have a little appliance made from an ordinary pair of tweezers to place in this tube, and I dilate the tube to any extent that may be necessary, which I pass down over the tooth. This tubing acts as a means of retaining the medication and keeping it, at the same time, thoroughly separated from any metal fillings that may be adjoining, or metal crown. A section of the tube may be pressed down if the cavity is near the gum, and we will entirely insulate that part of the tooth with this tube. The tube is as thin as a rubber dam, and instead of applying the cocaine by the use of cotton I take the tube, bulge it out on one side wherever I want the cocaine brought into contact with the shallow surface of the crown.

There is another feature I will speak of where the crowns have been denuded or robbed of their enamel, and by that time a set crown is prepared for it. You simply slip one of these

tubes over and dismiss the patient, and the tooth is entirely protected. In addition to that, if we cut a section we have a saucer like cavity that cannot retain the preparation very well for twenty-four hours, and this tube will hold it there without the secretions interfering. These tubes come in very nicely in taking impressions where we have a long tooth and isolate it, instead of waxing them up. The thinness of the tube enables you to readily dislodge the plaster in taking the impression.

Dr. J. H. WOOLLEY: I have not heard anything said as to whether cataphoresis is self-limiting. It is rather discouraging for those who feel inclined to relieve patients of pain by resorting to cataphoresis to hear that it is necessary for us to have as much knowledge as one who has graduated from a technical school of electricity. I would like to know what he means when he says that we have "got to be careful" in the use of cataphoresis. We have our voltage before us and should study to know its limitation.

In our experiments we ought to go slowly. We should take voltage by degrees in different patients, collect data and compare notes. It seems to me, that with any anæsthetic we should understand its power, and know how far to go in the use of chloroform or any other anæsthetic.

Dr. CUSTER: If I understood Dr. Woolley correctly, his first question was whether cataphoresis is as self-limiting as cocaine. I think there can hardly be any question but what it is. When we consider the voltage and conductivity of the cavity we can figure out how far the cocaine will be projected.

Dr. WOOLLEY: How do you know it is self-limiting by general experiments?

Dr. CUSTER: On general electrical principles. Only so much can be carried in as would carry the voltage there whatever resistance there may be. After one has had a little experience he will know how far he can go in each case according to the depth of the dentine he wishes to penetrate. Every dentist will have to find that out experimentally or from his class of cases.

In answer to the other question, that we ought to be practical electricians in order to use cataphoresis, I do not think it is necessary for us to go that far, but we must understand the fundamental principles of electricity, which we all do, as well as the physical characteristics of dentine, so that we must couple these two things together as well as the management of the appliance. And that

brings up the point that when we are beginning to operate with cataphoresis we should select an easy case in which we can see all of the surroundings, so that we can manage or control the instrument, then gradually we can devise plans for cataphoresis upon more difficult cavities.

Dr. WOOLLEY: In my experience with cataphoresis I have been very much interested to know something about its limitation, about how far the diffusibility of cocaine or the medicine used extends. In using it to kill pulps, I have found the removal painless, but at the apex, near its formation, sensation was not as great as when the pulp was alive, but there was sensation, which showed that it was self-limited in that case. It seems to me, experiments might be made in that direction to determine the diffusibility of cataphoresis.

Dr. F. O. HETRICK, of Ottawa, Kan.: I do not wish to let the subject pass without saying a word or two about the mental treatment of cases of sensitive dentine. It is not necessary for us to study psychology in its entirety, but we need to know a little about psychological principles. I object to some of the remarks made by Dr. Brown. I think he said he did not believe in hypnotism, yet he uses it. He uses hypnotism in its early stage. I have used it for about ten years. I began to use hypnotism because I was monkeying with the buzz-saw—electricity—and my results were not satisfactory. Dr. Brown uses hypnotism just as much as I do. I do not practice it to the extent of rendering my patients unconscious. Hypnotism is only sleep artificially produced. You can throw yourself into a hypnotic trance. I do not believe in using it to the extent of somnambulism, but I use it in the minor stages as Dr. Brown does. I venture to say that I could fill the teeth of any intelligent man painlessly if he would keep in touch with me, but I cannot do so if he does not.

Dr. CHAS. P. PRUYN: I have had a limited experience in the use of cataphoresis, with success in many cases and failure in others, and the more recent experiences in the use of the electric current convinces me that the failures were due more to my ignorance of the knowledge of the proper use of this agent than to the agent *per se*.

In the preparation of a small labio-gingival cavity in a superior central incisor I was unfortunate enough to burn and thoroughly destroy the gum and alveolar tissue, to the extent of one

third of the root covering. Fortunately the gum has been nearly replaced with new gum tissue.

I was pleased with Dr. Brown's description of the use he makes of suggestion in controlling pain, but was a little surprised that he did not confess to us at once that he is a successful hypnotist, as I firmly believe that every successful doctor from the days of Herodotus to the present time has used hypnotism in some form, although possibly unconscious to himself.

Hypnotism in the form of suggestion certainly plays a very important part in the use of drug medication, and also without drugs, as has been proven in thousands of cases.

"Christian science," so-called, or the mind cure, or faith cure, or any of the similar countless fads of the present time that are used in the cure of disease are simply different forms of the use of suggestive therapeutics.

Psychological medication certainly has a field of usefulness in the treatment of diseased conditions.

Dr. I. A. FREEMAN: Speaking of voltage: with the lowest voltage the patient will have more or less pain. It is in my experience very difficult to get past four volts without pain, by taking even thirty minutes. I would say this, that those who contemplate treating teeth cataphorically should understand that even with low voltage the pain in many instances is greater than it would be if a cavity were prepared without cataphoresis. It is often difficult to get up to ten volts, owing to the pain caused by the electric current. It has been said that we should use ten volts, but we cannot do this at once; it takes time to get there, even with a primary battery. Then, too, we are told by experts that there is great danger in the use of the street current. Doubtless this is so. It has been shown that very serious accidents have occurred by the contact of what we term the Edison current, with that of the trolley system, where we get an enormous voltage. These are the things that it is necessary for us to consider as much as anything when we are contemplating the use of the cataphoric process in obtunding sensitiveness of dentine.

Dr. R. H. KIMBALL: While the discussion has wandered somewhat from the subject of sensitive dentine there has been considerable said about the danger of electricity. It is upon that point I want to say a few words. I have used the electric current to some extent and I had an experience the other day which sur-

prised me. It might occur to any man as it did to me. Fortunately nothing serious happened, but it might have been disastrous. I adjusted everything in proper position and began the application of the current. I examined the electrode and was not satisfied with its position; I turned off the current, readjusted the electrode or started to do so and as I brought the point of the electrode in contact with the cotton in the cavity the patient received a sharp shock. I looked at my rheostat to see whether I had really turned off the current and I found it was. I attempted to do the same thing again and there was another decided shock. I laid aside the current entirely; the negative pole was still adjusted to the patient. What was it that caused the shock? I found that my foot was in contact with the base of my chair and both the patient and myself received a shock. I went ahead, kept my foot off the chair and obtained perfect results. We must use cataphoresis with a great deal of care and thoroughly understand certain laws relating to electricity or the results will prove anything but satisfactory.

Dr. G. V. I. BROWN: I recognize several mental states, while the gentlemen who have spoken are making one mental state to cover the whole ground. Hypnosis means sleep. There can be natural sleep, in which there is no mental disordination, or a somnambulistic state, in which there is mental disordination. There may be some centers of the brain working without a governing influence on the centers, or may be a condition in which the mind works automatically. Thus, I object to the use of the word hypnotism. Its use has become odious, and I recognize at least four states in which the mind may be in an entirely different condition, and there is no use in trying to cover them all with one term.

Dr. CHENEY (closing the discussion): I do not know that I have anything particular to say in my closing remarks. There is one subject, however, that I wanted to say more about in the paper, namely, the power of suggestion. While I do not believe in hypnotism being carried to the extent of somnambulism, I do believe that a great deal of good can come from suggestion or mental cure, whatever it may be termed. I recall one case in particular of a child that I wish to relate in this connection. She was a little girl and came to my office three years ago this winter. She lived some fifty miles from my city and her parents would rather send her a dozen times for treatment than to have all her teeth attended to at one sitting in the condition I found her. The first

time she came she was very nervous. I partly prepared two cavities and filled them with Hill's stopping, and sent her home after having made another appointment. She probably came to my office five or six times. At first she would sit bracing herself against both the foot rest and the arms of the chair, her muscles perfectly rigid. I talked kindly to her about it and tried to influence her to relax the muscles, and after two or three sittings the little girl would sit in the chair easily for two or three hours at a time without any dread or apparent suffering. Suggestion is certainly an excellent thing. I believe that by securing the confidence of our patients, treating them gently, using sharp burs and excavators, mild medicaments and asking them to sit with relaxed muscles that nine-tenths of our operations can be performed comparatively painless.

The subject was passed and the society adjourned.

STREATOR PROFESSIONAL FELLOWSHIP CLUB.

The dentists of Streator, during the month of January, organized themselves into the following society :

Basis of membership in the Streator Professional Fellowship Club, with the desire for mutual benefit and professional fellowship, and to help each other in all worthy ways—in intellectual, ethical and professional culture—the undersigned have associated themselves in a professional fellowship club. The officers shall be a president, vice president, secretary and treasurer, whose duties shall be the same as those usually borne by such officers. Meetings shall be held from time to time, as the members desire. The officers and members are : Dr. J. A. Curry, president; Dr. T. F. Henry, vice president; Dr. Dexter H. Davison, secretary and treasurer; Dr. F. O. Finley and Dr. C. R. Taylor.

The first meeting of the club was held Thursday evening, March 4, 1897. The evening was passed very advantageously, Dr. Curry leading in the discussion of some of the most important questions in dentistry. Dr. Taylor will prepare a paper on mechanical dentistry for the next meeting, May 27, 1897. Just before adjournment Dr. Davison told of a very amusing incident that occurred in his office a few days before.

A little fellow came in to have two temporary molars extracted. He jumped into the chair with high glee, believing, as his parents had assured him, that it would be "lots of fun." But when the first one was extracted he began to yell and climbed out of the chair. His mother inquired if he was not going to have the other one extracted. He became quiet in an instant and assumed a very thoughtful air; then shutting his little fists tight he answered in a very decided manner: "No! I'm not going to have that pulled till I get to be a *great big man*, so I can lick the doctor if he hurts me!"

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STILL TOO MUCH MATTER.

In presenting the whole of the clinic report of the Chicago Dental Society for February, we find our columns so crowded that we defer the publication of original papers, book reviews and college commencements until our next issue.

ILLINOIS STATE DENTAL SOCIETY.

It is hoped by the officers and members that the meeting in May, at Peoria, will be one of the largest for several years. The programme is excellent and we are sure every one near enough to Peoria will attend from other States, adjacent, to Illinois.

IOWA STATE DENTAL SOCIETY.

An excellent programme, a central location and a large number of active dentists, will assure a full attendance at Des Moines, May 4-7, 1897.

REVIEWS AND ABSTRACTS.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION, 1896; 144 pp. The S. S. White Dental Mfg. Co., Philadelphia.

This volume is before us, editorially and mechanically up to the usual standard, which means, of course, nearly perfect. The amount of matter is less, perhaps, than it has ever been, owing to the paucity of original matter contributed in the form of papers or reports. The report of the Illinois State Society for 1896 contains a fourth more matter. Criticism of the American Dental Association for its apparent lack of accomplishment in comparison with what it has assumed to do, has been made so often, and ^{rela} n members, as to have become trite and tiresome. There is an outflow of this sort at each yearly meeting. It breaks forth in the wail of the last in-coming president, Dr. Truman, who evidently fears that he has been placed at the head of an organization, as he strongly hints, "that is standing still, or that seems to be in a dying condition."

Now it appears to this reviewer that possibly things have so changed within recent years as to make the true functions of the American Dental Association quite different from what they were once.

A national organization is necessary and important. There is no doubt of it, and why? It is necessary, first, for the promotion of the unity and harmony of the whole profession of the United States, for consultation between all sections, upon matters of education, and legislation. Its highest purpose is to prevent segregation of interest, sectional jealousies and narrowing provincialism. If a national organization should do little more than to make men of all sections acquainted one with another, promoting mutual understanding, good will and friendship, without any scientific work whatever, it would pay beyond the power of calculation; in fact, it would have reached the end most important.

It is not to be expected that the national organization will henceforth accomplish any great amount of so-called scientific work. That day has gone by. The multiplication of local societies, which call upon their members exhaustively for the best they can do, makes such accomplishment not only impossible but unnecessary. At the best, there is now in society work a great deal of "threshing over old straw," a proceeding which adds less to the

dignity of the American Dental Association than that of any other society, and has not been infrequent.

The fact is that the organization has no time for that sort of thing. It is, or should be, a truly representative body, for the promotion of interests that are common and national; nay, world wide.

It should be an association for review. It should consider not trivial but the great and important things that need careful attention and concerted, practical action. The most important of all just now is the union of the north and south, too long delayed. If the meeting of '97 shall accomplish this and nothing else, it will be the most important ever held. Next to this is the question suggested by Mr. Crawford in the president's address last year, viz., the securing of practical uniformity of dental laws in the different States. This is no idle dream—we have got to come to it in time, with reference to many things—bankruptcy, divorce, and matters of medical and legal practice as well as dental.

To be truly representative, the association should have many delegates from local societies East and West, North and South. True, they are frequently appointed, but they do not attend. Why? First, because attendance is often expensive, greater than the individual thinks he can afford unaided. A society should be willing to pay at least the traveling expenses of its delegate. It should be made an honor not to be shirked but willingly accepted by the best men, many of whom, and not to their discredit, are poor in pocket. Second, it would add to the interest and attendance of the American Dental Association if the time of meeting could be somewhat elastic. Southern men would enjoy a northern place in summer, northern men especially a southern meeting in winter. In any event it seems to the reviewer that the fixed time is misplaced in August. The time unfit for work in the office is unfit for work anywhere. Congress does not convene for business in July or August, nor should any other great body, not even the educators. It is a mistake. "But the time," some one says, "it is the time when we can get away." Well, get away into the woods, and *take* time for work when work will amount to something.

There is not much that needs to be said about the transactions proper of '96; they were proper enough—what there were of them. We might say, to be facetious, "Transactions of the A. D. A., Limited." However, of the two, limited and unlimited, the first is preferable.

There was first a voluntary essay, of much interest, by E. A. Bogue, entitled, "Prosthesis Extraordinary," being the report of two cases of surgery, in Paris, in which Dr. Michaels, a dentist, who constructed apparatus for preserving the original length of bone after resection—a platinum and iridium bridge was made in one case for the jaw; in another, for the humerus, being screwed to the ends of the bones. The periosteum having been preserved, there was in each case a reformation of bone along the bridge, which was thus the means of preserving the proper length and usefulness of the member. This appears to be an important contribution by dentistry to general surgery.

Dr. Bogue states that the first operation, that on the lower jaw, was for "a young girl twenty years of age." Perhaps with an old girl the result would have been less favorable.

J. S. Cassidy, chairman of the Section V., read a report on materia medica and therapeutics, which dealt exclusively with cataphoresis and local anæsthesia. An interesting point in this report was that cataphoresis often occurred without electrolysis.

L. P. Bethel read a paper entitled, "Lining Root Canals," which means simply in this case the deposit of silver nitrate on the canal walls with the aid of electrolysis. After a long discussion, which drifted a good way from the subject, the practice seemed to be thought by most as of doubtful advisability.

Under the same section, J. W. Wassall read a paper entitled, "The Disinfection of Pulpless Teeth," in which he voiced the conclusions of bacteriological science up to date, and criticised with deserved severity those teachers who refuse to adapt either practice or teaching to the new obligations imposed.

In the discussion on this paper only one man was found to take issue squarely with generally accepted facts.

J. D. Patterson, Chairman Sec. VI., Physiology and Etiology, read a report, consisting mostly of extracts from two papers, one by Dr. Gudex and the other by Dr. M. L. Rhein, on the uric acid theory as relating to pyorrhœa alveolaris.

The general conclusions are pretty well summed up perhaps in the expressions: "The acid dyscrasia is not a cause, but like every other debilitating condition, it may be regarded one of the etiological factors," and "The uric acid dyscrasia can be associated with almost any disease accompanied by malnutrition."

W. C. Barrett of Section VII., Anatomy, Pathology and Sur-

gery read an interesting paper on "The Orbicularis Oris and the Muscles of Expression." It was illustrated in such a way as to make the descriptions understood, with practical bearing on prosthetic dentistry, and indirectly we may say on the preservation and regulation of the natural teeth as well.

Thomas Fillebrown, of the same section, read a paper with illustrations, entitled "A Study of the Relation of the Frontal Sinus with the Antrum," which with the discussion following constitutes a practical addition to the science and treatment of antral disease.

H. L. Ambler reported a case of nodule at the end of a lateral incisor.

Wm. H. Richards gave a lecture entitled "Artificial Pulp" with illustrations, which have been beautifully reproduced in a series of plates for the transactions.

Teeth were filled out of the mouth with a gelatine-like substance treated with formalin, under sufficient pressure to force the material to every place formerly occupied by pulp tissue; that having been completely removed by digestion. The tooth was then broken away, leaving the "artificial pulp" intact, ready for examination or photography. The specimens furnish a true revelation, and it is to be hoped that perhaps Dr. Richards' plates may, with additional ones, be placed on the market in some chart like form so as to make it possible for all dentists to have them in possession, as they ought.

Section II., Dental Education, Literature and Nomenclature, made a report, first through the president, Louis Ottofy, on education. From this we cull a few figures: There are now 51 colleges in the United States conferring the dental degree; there were 1,446 graduates in 1896, as against 503 in 1886, and the grand total for ten years is 10,267.

S. H. Guilford of the section (II) read a report on nomenclature, which we have not space to notice with analysis. It should be republished in various dental journals. As to some of the recommendations there may be question, but they are generally good. The report represents an amount of painstaking labor, for which Dr. Guilford particularly is entitled to large credit.

Altogether the transactions of 1896 represent good quality rather than quantity, which is well, and the American Dental Association has no reason to be discouraged.

GARRETT NEWKIRK.

COLLEGE COMMENCEMENTS.

Chicago College of Dental Surgery, Dental Department of Lake Forest University, the fifteenth annual commencement, Thursday, April 1, 1897, at 2 p. m.

Graduates—Oliver Spencer Applegate, Alfred Ed. Dominion Austin, James Albert Atchison, Elmer Curtis Burkholder, Frank Clinton Babcock, Edwin Angelo Billig, David Newell Boatner, Edgar Robert Bennecke, William Porter Brown, Carl Dewitt Bates, Charles Henry Broadway, Ernest Oscar Bloomer, Bertis Bee Bemis, Washington Buchanan, Evan Henry Bryan, James Bryan Baker, Henry Brown, Guy Thomas Brearley, William Bebb, Charles Hiram Blackburn, Benjamin Franklin Blosser, Leon Gilford Borst, M. D., Claude Allison Costley, Perry Lee Cambell, George Albert Cütteridge, Charles Havelock Cütteridge, Franklin Oliver Cates, Lorwin Noah Cates, Frederick Hamilton Colter, Edwin Monroe Clotfelter, Frank Brunner Clemmer, Howard S. Clemmer, Martin Christensen, Clifford Warren Carr, Gustav Everett Cleophas, John Everett Clark, John Ward Corbin, Ph. C., Otis Edward Chappell, Charles Washington Cotton, Charles Arthur Christin, Harry Clifford Devereaux, Harry Louis Dickinson, John Sweet Donald, B. Sc., William Edmund Dunbar, Ernest George Downey, Frederick De Bruin, James Oregon Dunn, Christian Friedrich Ernst Dreibrodt, Blake William Dutton, Milton Eisenstaedt, Charles Durbin Eversole, Anthony Leroy Entsminger, Solomon Berman Friend, Henry Ember Fowler, Harry James Glasgow, Haakon Leonard Gerner, Warren A. Giddings, Guy Boyce Harvey, Fred. Liebinau Hasbrouck, Stephen R. Harrison, Ph. B., Charles Northrop Hoagland, Grier Hanson, Irving James Herrick, Robert Maximilian Hettinger, Harold Hawthorne Hayes, Thomas Henry Hood, Morris Lincoln Hilton, Robert Henry Huffman, Louis Steaven Irgens, Ph. G., Charles Beach Ingram, John Harvey Johnston, Charles Abraham Kaye, August Fredirich Kemper, Willett Edgar Kyle, Bert Amos Kimball, Robert Francis Livingston, Alfred Walter Lane, Henry Charles Loppenthien, William George Loppenthein, Walter Bert Lockwood, B. S., Mahlon Ramsie Lindley, George Alfred Miller, Charles Gardner Morrell, George Edward Mason, Louis Hiram Matter, Valentine Massman, Martin D. Molitor, John Laurence Malone, Francis Nicholas Maginnis, Frederick James Martin, Harry Irving Miner, Lantson Daniel Mills, Thomas Scott McAyeal, Erwin James McKee, George Osborne Orr, D.V.S., Edward Francis O'Donnell, Fred B. Olwin, Maurithz Walter Olson, James Harvey Pearson, William Leaton Pank, Harry Hume Porter, Arthur Israel Porges, Harrie Allen Penfield, Joseph Carl Pasqueth, Joseph Loran Pease, Price Walton Rood, Charles Abraham Raver, Frederick Hastings Roberts, Stanley Rea, Charles Frederick Rodolf, Edward Burhans Rhinehart, Enoch Arden Reyher, Henry Warner Rich, George Edgar Stevenson, Harry Thurman Silver, Henry Stephen Smith, Emil Theodore Strongquist, John Franklin Sweeney, John Martin Singler, Oscar Irving Spitz, Brace David Schrantz, Thomas Euell Stoddert, Henry Dee Single, Burton Schrock, Josiah Bridges Solomon, William Miles Standish, D. V. M. S., Joseph Satory, Hezekiah Morrison Thatcher, Raymond Orput Trenholm, Delos Bennett Terry, Fred. Alonzo Tate, William McConnell Terry, Ross Sylvester Vedder, Edgar Randolph Weart, Lewis Edgar Wood, Martin Williams, John Liephart Wetzal, Robert Henry Wagner, George Washington Wilson, Richard Thomas Woollard, Julien Emerson Young, John Mathias Yahres.

Matriculates for the session, 503.

MEMORANDA.

Are you using ammonol?

Observe that the Iowa society meets in May.

The new dental law is now before the legislature.

Are you going to Peoria? Illinois meeting, you know.

Dr. J. W. Wassall has removed to the Stewart Building.

Mississippi Valley Society at Cincinnati, April 14, 15 and 16.

Dr. John C. Storey is dead. We will give a sketch of his life shortly.

Amputating apices of roots is not always successful as a means of curing abscess.

G. Viau is now the editor in chief of *L'Odontologie*, succeeding M. Roy, retired.

Dr. C. L. Goddard, of San Francisco, was in Chicago on his way from the east April 13 to 16.

The State Board of Dental Examiners will hold a meeting in Peoria, Monday morning, May 10, at the Hotel Fay.

The Iowa State Dental Society will meet in Des Moines, May 4th to 7th, inclusive.
W. G. CLARK, Secretary

It is expected that a large number of dentists will go to Old Point Comfort next August. There are three good hotels there, the best ones being the Chamberlin and the Hygeia.

We spent a few hours recently in Mobile with Dr. C. P. Robinson, who is one of the most progressive dentists in the South. All of the latest *armamentaria* of the dentist are found in the offices of leading dentists along the coast from Mobile to New Orleans, and no one can fail to notice the energy and enthusiasm of such men as Drs. Walker, Robinson, Friedrichs, Kells, Knapp, Bauer and others that we had the pleasure of calling upon during a brief visit.

CHICAGO DENTAL SOCIETY.

Officers for 1897: President, A. H. Peck; First Vice President, Don M. Gallie; Second Vice President, G. T. Carpenter; Secretary, E. MaWhinney; Corresponding Secretary, Geo. B. Perry; Treasurer, E. D. Swain; Librarian, H. Alfred Gunther; Board of Directors, J. G. Reid, Geo. H. Cushing, J. N. Crouse; Board of Censors, D. M. Cattell, A. W. McCandless, J. J. Whaley.

ILLINOIS STATE DENTAL SOCIETY—SPECIAL NOTICE.

Dentists of the State are cordially invited to attend the meeting and come prepared to join the society. Any reputable practitioner is eligible for membership and need not fear rejection if properly vouched for by two members of the society. It is the desire of the officers to create a membership of 500 within the next year or two. Will you help swell this number? J. G. REID,

Chairman Executive Committee.

ILLINOIS STATE DENTAL SOCIETY.

The thirty-third annual meeting of the Illinois State Dental Society will be held at Peoria, May 11 to 14, inclusive, 1897. An excellent program is in the present issue of the DENTAL REVIEW. Members are urgently requested to be present. The profession, generally, is cordially invited. A reduced rate of one fare and a third has been granted from all points within the State.

LOUIS OTTOFY, *Secretary*,

Masonic Temple, Chicago.

THE ODONTOLOGICAL SOCIETY OF AURORA AUXILIARY TO THE ODONTOLOGICAL SOCIETY OF CHICAGO.

The officers are: Dr. C. C. Smith, president; Dr. F. T. Bell, vice president; Dr. C. R. Currier, secretary; Dr. B. T. Emigh, treasurer. The next regular meeting occurs on April 13, at office of Dr. Currier, 222 Coulter block, and we expect to have Dr. C. S. Case with us.

Will be glad to give any further information at any time.

Yours truly,

CHAS. R. CURRIER.

SEVENTH DISTRICT DENTAL SOCIETY.

The annual meeting of the Seventh District Dental Society of the State of New York will be held in the assembly room of the new Osborn House, Rochester, N. Y., Tuesday and Wednesday, April 27 and 28. Meeting will be called to order at 10 o'clock Tuesday.

PROGRAM.—1. President's annual address; Dr. B. S. Hert, Rochester.

2. What shall we do to increase the attendance of our society meetings? Dr. F. A. Greene, Geneva. Discussion opened by Dr. W. A. White, Phelps.

3. Practical hints, Dr. F. W. Proseus, Rochester. Discussion opened by Dr. ———.

4. Wherein does a country dentist differ from a city dentist? Dr. James Dennison, Waterloo. Discussion opened by Dr. J. A. Burkhart, Dansville.

5. Dental ethics, Dr. H. S. Miller, Rochester. Discussion opened by Dr. Chas. T. Howard, Rochester.

6. Observations on adenoid growths and thumb sucking in producing irregular dentition, W. W. Skinner, M. D., Rushville. Discussion opened by Sumner Hayward, M. D., Rochester.

7. Character, as expressed by the maxillæ and teeth, Dr. J. Wright Beach, Buffalo. Discussion opened by Dr. Frank French, Rochester.

8. Preparatory work in artificial dentures, Dr. J. F. Knapp, Geneva. Discussion opened by Dr. J. H. Beebe, Rochester.

9. Aseptics and aseptisis, Dr. Frank Sibley, Rochester. Discussion opened by Dr. ———.

10. A talk on cataphoresis, Dr. R. H. Hofheinz, Rochester. Discussion opened by Dr. W. W. Smith, Penn Yan.

11. Weld's chemico-metallic method of filling root canals, Dr. F. H. Lee, Auburn. Discussion opened by Mr. D. H. Piffard, Piffard, N. Y.

12. A talk on the "X Rays" and a practical demonstration of their application in oral and general surgery. By Mr. John Dennis, Rochester.

Mr. Dennis will present some entirely new and original applications of the X rays in surgery. The apparatus will be the latest and best.

It is expected that this demonstration of the X rays will be the most complete ever presented.

There will be a display of dental goods and appliances

The New Osborn House will be the official headquarters. A rate of \$2 per day has been made by the management. First come, first served, will be the rule, but rooms may be reserved on or after April 15, by addressing New Osborn House, Rochester, N. Y.

WM. W. BELCHER,

Chairman Business Committee.

ILLINOIS STATE DENTAL SOCIETY.

SCIENTIFIC PROGRAM.—1. Annual address by the president, Dr. C. R. Taylor Streater, Ill.

2. Report of the committee on dental science and literature, by Dr. A. W. Harlan, Chicago.

3. Report of the committee on dental art and invention, by Dr. J. E. Keefe, Chicago.

4. Pyorrhœa alveolaris, by Dr. J. W. Wassall, Chicago. Discussion opened by Dr. A. W. Harlan.

5. Classification of cavities and rules governing their preparation, by Dr. W. E. Harper, Chicago. Discussion opened by Dr. C. B. Rohland, Alton, Ill.

6. Opinions of the Illinois dentists regarding dental societies, by Dr. E. H. Allen, Freeport. Discussion opened by Dr. Geo. H. Cushing, Chicago.

7. How shall we best insert a gold filling? by Dr. Arthur G. Smith, Peoria, Ill. Discussion opened by Dr. C. N. Johnson, Chicago.

8. Diffusibility of coagulants in dentine, by Dr. E. Lawley York, Chicago. Discussion opened by Dr. J. E. Hinkins, Chicago.

9. Be a—man, by Dr. A. H. Peck, Chicago. Discussion opened by Dr. A. H. Fuller, St. Louis.

10. Static anchorages for the regulation of teeth, by Dr. C. S. Case, Chicago. Discussion opened by Dr. Garrett Newkirk, Chicago.

11. The relations of the teeth to the lips and face, by Dr. A. O. Hunt, Chicago. Discussion opened by Dr. G. A. Thomas, Chicago.

12. Practical things in dental practice, by Dr. J. G. Templeton, Pittsburg. Discussion opened by Dr. Edgar D. Swain, Chicago.

13. Anchoring large contour fillings in incisors, by L. W. Skidmore, Moline, Ill. Discussion opened by Dr. R. M. Pearce, Rock Island

14. Report of the supervisor of clinics, by Dr. T. W. Pritchett, White Hall

15. Questions submitted for discussion, by local societies from the American Dental Association:

(a) To what extent and when are we justified in using cataphoresis? Is there danger of injuring the dental pulp or other tissues by its use?

(b) What are the best methods of bleaching teeth?

PROGRAM OF CLINICS.—Dr. E. K. Blair, Waverly. Gold filling in distal cavity of a cuspid.

Dr. G. A. Thomas, Chicago. Fusing porcelain with the electric furnace

Dr. Gustavus North, Springville, Iowa. Will demonstrate a method of constructing partial lower vulcanite dentures.

Dr. G. B. Dillon, Sterling, Ill. Gold filling in bicuspid using matrix.

Dr. R. N. Laurence, Lincoln, Ill. Will treat cases of pyorrhœa alveolaris by Dr. Younger's method.

Dr. C. C. Corbett, Edwardsville, Ill. Gold filling in proximal cavity.

Dr. J. W. Cormany, Mt. Carroll. Fillings with Dr. Black's modified alloy.

Dr. E. T. Brigham, Watseka, Ill. A method of using vulcanite teeth—bicuspid and molars—in bridge work.

Dr. R. M. Pearce, Rock Island, Ill. Gold filling hand mallet.

Dr. C. B. Sawyer, Jacksonville, Ill. Fillings with Dr. Black's modified alloy.

Dr. F. Primrose, Springfield. A simple method of fitting a Logan crown.

Dr. C. H. West, Farina, Ill. Alloy filling—distal cavity in a bicuspid or molar—using the Booth matrix clamp.

Dr. J. W. Collins, Lincoln, Ill. A gold filling.

Dr. Thomas L. Gilmer, Chicago. Filling a superior bicuspid with gold—demonstrating scientific preparation of cavity, and restoration of contour.

Dr. B. D. Wikoff, Chicago. Making crown—porcelain faced bicuspid.

Dr. F. B. Noyes, Chicago. Microscopic examination of amalgam fillings.

Dr. Nels Nelson, Chicago. Making bicuspid crown using English tube tooth; also exhibit of crown and bridge specialties.

Dr. W. V.-B. Ames, Chicago. Demonstration of the underlying principles of cataphoresis.

Dr. P. J. Kester, Chicago. Instrumentation of amalgams.

Dr. C. N. Johnson, Chicago. Exhibit of prepared cavities in natural teeth.

Dr. C. P. Pruyne, Chicago. Some novel methods of applying the rubber dam, and wedging.

Dr. Don. M. Gallie, Chicago. Building down central incisor corner with platinum and gold.

Dr. J. O. Ely, Chicago. Practical demonstration of cataphoresis.

Dr. W. H. Taggart, Chicago. New method of applying the rubber dam to difficult buccal and labial cavities—also something in porcelain work.

Dr. S. W. Lakin, Eureka, Ill. Restoration of one-quarter to one-third occlusal edge central incisor, with screw and Watts' crystal gold.

Dr. J. H. Woolley, Chicago. Proper methods of opening pulp chambers and root canals.

Dr. I. A. Freeman, Chicago. Filling distal cavity left superior cuspid.

AN INSTANCE OF TRIONAL POISONING.

Gierlich had a patient afflicted with morphinomania of a slight degree, who, during a period of two months, took daily on account of sleeplessness, about 45 grains of trional. Serious nervous symptoms developed. Marked ataxia, a light tremor over the whole body, and a deep depression of mind which could only be broken by strong stimulus, were the chief symptoms. The memory was much affected as were writing and speech. There were no delusions. After the trional was withheld, the morphine being continued in the usual dose, the condition gradually improved, but it was five weeks before the last traces of nervous disturbance disappeared. The practical lesson in this case is that if trional is to be given for a long time, the dose must be greatly reduced or omitted altogether occasionally in order to allow its complete elimination.

THE
DENTAL REVIEW.

VOL. XI.

CHICAGO, MAY 15, 1897.

No. 5

ORIGINAL COMMUNICATIONS.

DENTAL MUSEUMS AND THEIR ARRANGEMENT.*

BY W. BOOTH-PEARSALL, FELLOW ROYAL COLLEGE OF SURGEONS IN IRELAND,
DUBLIN, IRELAND.

Mr. President and Members of the Chicago Dental Society: I am greatly honored by the invitation you have forwarded to me through the kind hands of my friend Dr. Wassall, that I should address you on some subject of interest to myself.

The cordial and hearty welcome I received at the hand of many foremost among you when I visited Chicago in the autumn of 1895, I can never forget. Words fail me to express the regret I now feel I did not attend in person the great meeting of our profession you held in Chicago a few years ago.

It was impossible therefore I should refuse so gracious an invitation as to send you a paper on a subject which has, I venture to think, a little freshness and originality about it.

I offer you therefore the outcome of some thought and hard work, asking you to take steps that my inventions are to be open to the whole profession, and yet protected from the hands of the pirate.

I have not protected my museum inventions, as I would rather place whatever knowledge or experience I have gained while working out this subject at the service of my dental brethren throughout the world, who may be disposed to form museums for study, or for the mere security of valuable and rare specimens.

The first annual meeting of the British Dental Association held in Ireland took place in Dublin in August, 1888.

*Read before the Chicago Dental Society.

The most original and to my mind attractive feature there was the temporary museum, collected, classified, arranged, and catalogued for the occasion, costing much correspondence, labor and tenacity of purpose.

This museum of dental specimens and casts was the most complete and practical collection that had been held in the united kingdom.

The published catalogue filled seventy-four pages octavo, and the members of the British Dental Association were deeply interested in the collection, from the facility of reference, the arrangement and classification permitted.

Since 1888, the collection of dental material, its arrangement and display, has occupied my thoughts a good deal.

So far as my observation has extended, dental museums are not what they ought to be, and are as a rule unworthy of our professional skill.

I shall endeavor to interest the members of the Chicago Dental Society, in some of the methods I have invented for the purpose of exhibiting specimens, so as to be ready of reference to the student and the practitioner.

The methods I employ can be used in many other classes of specimens, in natural history, in mineralogy, materia medica, and many other subjects when specimens are small and invite minute examination.

By enlarging the size of the transparent envelopes, specimens of greater dimensions than what we use in a dental museum can be adequately shown and displayed by my method.

By a personal examination of the methods used in many of our British Museums, and from inquiries made with respect to those of other countries, I came to the conclusion that the arrangement and display of specimens in permanent dental museums are subjects of practical importance that have not been adequately considered.

A large proportion of the specimens in which we dentists are interested are relatively small. They should be placed so that they can be easily examined and easily arranged.

Roughly speaking, the material we would use in dental museums may be divided into two classes, tooth specimens and plaster casts. To classify and display this material we have in

common use the card method, the glass jar method and the tray or cell method. Let us consider these methods.

The card method is, for small objects, perhaps the most usual method in all museums. It has one great disadvantage with respect to dental specimens in that it limits our powers of examination to the side of the object exposed to view when it is attached or cemented to the card.

As tooth specimens do not always have their peculiarities placed only on one side, with a view to their ultimate use in a permanent museum, but in many instances show other peculiarities of interest to us, the card method is not very useful to us.

The cards also need renewal from time to time, as the cards become light-stained and dusty; and the specimens have a perverse tendency to become detached, should they be pasted or cemented to their support. In the case of fragile or delicate objects, it is not always possible to drill holes in them in order to attach them to the card with screws.

The tray or cell method is only a variation of the card method with specimens thrown into each compartment without attachment or arrangement. To display the cards or trays recourse has to be had to the use of table glass cases, which are fatiguing to examine, difficult to light, greedy of floor space and more subject to accident than any other form of glass case.

The glass jar method, on the other hand, facilitates the exclusion of dust, if jars or bottles of suitable form be selected. This method may be considered of great value, as it supplies us with transparent envelopes, in which to place our specimens.

We can by this method make examinations of the specimens without much loss of light, and without much risk of accident to very delicate objects.

It is a matter of importance, therefore, to choose a suitable glass vessel, particularly in a museum such as a dental one, where only a very limited amount of cash can be expended, and the zealous curator is either "passing rich on forty pounds a year," or nurtures his useful and unselfish work on "Kudos." Whether globular or cylindrical jars are large or small, when used for the reception of wet preparations their curved sides act as convex lenses, and distort or magnify the size of the object placed within them.

When dry preparations are placed within jars the high lights

on the curved surfaces of the jar are very perplexing, from the brilliant way the details of the museum windows, or the face and figure of the visitor, are reflected on the glassy surfaces. I may also appropriately refer in passing, to a method of displaying specimens, which is a combination of the card method and the glass jar method.

In many preparations made fifty years ago cards were used to support the specimens, and then placed in jars to exclude dust. In many preparations in which this idea has been used, sheets of talc or glass are used instead of the opaque card; showing an advance in method, as more surfaces of the specimens can be examined.

Having noted the defects and peculiarities of method you are all familiar with, I was led to make some experiments with a view of establishing some uniform and practical method of dealing with specimens of abnormal teeth, in the first instance, and with plaster casts in the second.

It was necessary to make provision for careful and minute visual inspection, while at the same time the specimen was protected from dust and injury, to provide for minute classification, together with facilities for growth in the collection as a whole, to enable any received type of specimens and its congeners to be referred to without loss of time, and finally facilitate registering and cataloguing the specimens as they enter the collection was not altogether a simple problem to solve.

I have chosen glass tubes 3 inches long by $\frac{3}{4}$ inches in diameter as the transparent envelope for specimens of teeth, for I have found that only a very small number of specimens will not go into such tubes. These tubes are passed through a template to insure uniformity of size before they are used for the reception of specimens. Each specimen is treated as an individual, belonging to a definite class or order.

The tooth intended to be mounted is carefully examined and a small hole drilled in some convenient spot. In this hole is cemented a tinned steel wire, the free end of which is securely fixed into the cork which is used to close the open end of the tube and thus exclude dust. I am careful to place each specimen in the middle of each tube, so that when the tube containing its specimen is placed in the collection, some uniformity of position will be observed. These glass tubes in which tooth specimens

have been mounted, are all carefully sorted into groups or classes, and can be placed in order in the museum glass cases, by means of the mahogany racks I have invented for the purpose; these racks are 21 inches long by 14 inches broad, $1\frac{1}{2}$ inches thick.

Each of these frames is to be divided into four spaces by means of three bars running across the frame lengthwise, which contain twelve circular sockets to hold the tubes, which can be readily introduced by having part of the sockets hinged.

When the hinges are closed, and the screws securing the hinged part put in, each tube can be revolved in its socket, permitting very close comparison of each specimen with its neighbors in the row or rack it belongs to.

Each frame holds forty-eight tubes, twelve tubes in each row. Now it is necessary for me to point out that I have treated the selected tooth specimens as individually as possible; the stiff but slender wire does not obscure the view of the specimen in any important particular, so that if we take a molar tooth as roughly resembling a rhomboid or cuboid form, six aspects of the specimen can be readily examined.

This precision of method enables us to use the anatomical or dental terminology of these surfaces, such as the coronal surface, the apex of the root, the buccal, lingual, mesial and distal surfaces of the teeth, as they touch their own immediate neighbors or articulate with their colleagues in their masticating or oral functions. You will notice that the frames are strong, rigid and remarkably free from cast shadows when they are placed in the wall cases I have designed for them.

In a private collection such racks can be used as drawers in a cabinet ready for reference or study when display or exhibition is not intended. By means of the wall cases specimens can be brought very close to the glass and groups or classes shown in all their variations. In the museum in process of formation in the Dental Hospital of Ireland the use of table cases has been avoided and I am glad to see they are being superseded in all modern museums.

The wall cases I have designed have been made so as to take the mahogany specimen cases, which we call racks, in any wall case. The wall cases have been made shallow so as take up little room and allow abundance of light as well as minute classification

or subdivision of the contents of the collection, whether specimens or casts.

The wall cases are four feet wide, five feet three inches high, divided into compartments, so as to hold eight of the racks with glass tubes behind the sash doors. The cases are made so as to go side by side without variation in contour to suit any room, whether it be lighted from the top or from the side.

Eleven and a half cases will allow me to display and classify 4,416 specimens of teeth in tubes, or taking an average of eight plaster casts to each shelf, 2,944 casts. The shelves in the glass cases correspond with the division of the racks. I can, if necessary, display casts and tube specimens in the same case. I can place the tube specimens in front of shelves furnished with casts. I do not recommend this method, except as a temporary convenience in arrangement or for storage.



Further experience in the arrangement of specimens of abnormal teeth would suggest that the racks of specimens should be placed between sheets of glass so framed that they could be slipped into their places and closed to exclude dust. These shallow glass cases could be hinged to the wall in such a way that the racks in the case could be opened from the wall like the leaf of a book, and enable a student to examine the specimens in their tubes by the aid of transmitted light as well as by direct light, when the frames are placed back into position in the wall cases.

The Pearsall method has, you will I trust admit, great adaptability for the display of dental museum specimens. The specimens are kept free from dust, can be minutely classified and examined, and placed in any order of subject that may be desired, such as we see for instance in the standard text-books on dental surgery.

I need not dwell on the value to us all if such orderly, well-displayed, well-organized collections were the rule in all our leading schools or dental societies. The collected material would be as easy of reference as a dictionary or encyclopædia. Were this principle acted on, and full collections made of abnormal teeth, casts of abnormal positions of teeth, mechanical work generally, in the form of dentures or bridges, cleft palate cases, instruments and artificial teeth as they come from the makers, together with specimens of celluloid, vulcanite, continuous gum, much could be

learned by a busy practitioner when a difficult case came under his notice he had not before experienced.

The treatment of plaster casts now requires a little attention at my hands. In the first place, I would point out that there is a needless bulk of plaster in most casts, which occupies valuable space without in any way adding to the exhibition or scientific value of the cast. This absorption of space proceeds in an arithmetical progression, so that in a collection of casts as usually presented by members of my profession, the useless plaster will be found to take up 50 per cent of the space caused by the casts on the shelves. I would recommend that all unnecessary plaster should be cut away, and the museum cast prepared as you see.

The points intended are seen at once. The cast stands firmly on its base and occupies the least possible space on each shelf, without being crowded. I would also strongly urge the anatomical or diagrammatical method of viewing the casts by placing those of the upper jaw so,  and the casts of the lower jaw so,  on the shelves. I would also color the casts in a uniform way, painting the teeth pale Naples yellow and the gum or alveolar border vermilion.

Natural, or shall I say lifelike representations of the oral cavity are invaluable in certain sections, but must be expensive and difficult to execute. Lifelike portrait of mouth and jaw can only be made by the accomplished few; diagrammatic treatment of such casts can be carried out by any neat-handed dentist or his assistant.

The illustrations will, I trust, make my meaning clear to you all in the brief description I have given of the cases; and I cannot speak too highly of the hinges invented by Mr. De Sales, the foreman of the Dublin Museum of Science and Art, in which hanging styles or mullions are done away with, and much saving of space is effected, while we have a very strong hinge and glass case. This admirable invention enables a wall case to be opened from end to end, and specimen cases be arranged at will from the position in which they will be viewed.

DOCTORATE ADDRESS.*

BY JOHN S. MARSHALL, M. D., CHICAGO, ILL.

Mr. President, Gentlemen of the Faculty, Members of the Graduating Classes, Ladies and Gentlemen:—As I stand in this presence, I realize most fully the honor which has been conferred upon me by my friends, the members of the dental faculty. I desire also at this time to give public expression of my appreciation of the bountiful hospitality of which I have been made the recipient, and of my obligations to these gentlemen and other professional brethren of Nashville, by reason of their many kindnesses to me and mine, in days lang syne. I nevertheless feel as did Mark Antony, that I have not the qualifications for a public speaker.

"For I have neither wit, nor words, nor worth
Action, nor utterance, nor the power of speech
To stir men's blood; I only speak right on;
I tell you that, which you yourselves do know."

It is customary upon occasions of this character, for the speakers to direct their remarks more particularly to those for whom the occasion was created, namely, the graduating classes. I trust, however, that my remarks will not be uninteresting to any of you. It shall be my purpose in the few minutes allotted to me, to endeavor to stimulate the minds of these gentlemen to renewed effort in study, by a contemplation of the achievements of a few of those grand men who have made possible the wonderful results of modern medicine and surgery; including dental surgery, men whom the profession and the world delight to honor for their discoveries in science and the blessings which they have brought to the human race. Such a contemplation I trust will give birth to an ambition which shall not only aspire to the possession of the highest degree of professional learning and skill, but which shall inspire a desire and a determination to be original investigators.

In Shakespeare's Henry the Eighth, Cardinal Wolsey says to his secretary after his fall:

"Cromwell, I charge thee, fling away ambition;
By that sin fell the angels; how can man, then,
The image of his Maker, hope to win by't."

Cardinal Wolsey was ambitious to be Pope of Rome and bent all his energies to the accomplishment of this purpose, regardless

*Delivered before the graduating classes of the medical and dental departments of the University of Tennessee. Nashville, Tenn., March 29, 1897.

of honesty or moral rectitude in himself or others. This was an ambition of gross selfishness and it met a merited defeat.

The ambition which I desire to arouse in you is not of this nature. I would stimulate in you a noble, self-sacrificing ambition; one which shall lead you to forget self and all selfish interests; one which shall impel you to search for those hidden mysteries in nature, which when discovered, shall give to the world more sure and efficient means of doing battle against the enemies of life, and thereby bring "length of days" and greater happiness and comfort to mankind.

With such sentiments and desires in your hearts you can say with Dr. Oliver Wendell Holmes,

"How blest is he who knows no meaner strife
Than Art's long battle with the foes of life."

There is much that is yet to be discovered in the realm of medical science, especially in the fields of embryology, of anatomy, of physiology, of chemistry, of bacteriology, of therapeutics and of pathology; while there are many mooted questions in theory and practice that are still unsolved. To settle many of these questions will require original investigation and experimental research. The untilled portion of the field of science then is your opportunity; embrace it, for the possibilities are great. Be not satisfied, however, until you have accomplished something in the line of original discovery which shall help to prevent the inception and spread of disease; to stamp out dread pestilence or mitigate in some way the pain and misery of poor, sick, suffering humanity; and though you may not have your names written in history nor inscribed upon some lofty monument, you will have the satisfaction of knowing that your names will be revered and honored, wherever disease, suffering and the fear of death are to be found.

Your presence here to-day is evidence that you have been stirred by a lofty ambition to enter the ranks of a most noble and beneficent profession. You have worked your way in a very literal sense through the curriculum of study provided by your Alma Mater. You have passed your final examination and have received the long coveted parchment stamped with the seal of the university of your choice. You have obtained the commendation of your teachers and are about to receive the congratulations of your sweethearts and friends. But let me ask, is your ambition satisfied? Is the striving for knowledge now to cease? Your

teachers would tell you that you had only just learned the A B C of the great subjects which they have been teaching you during your course of study and that the real acquirement of knowledge is yet to begin. You are at the present time like birdlings about to be thrust from the nest; you are to try your professional wings alone and unaided by those who have stood ready to guide every thought of your brain and every effort of your hands during the years of your college life. You are, no doubt, as well equipped for the flight as it is possible to make you in the time that you have spent in the halls of your Alma Mater.

What then is to be the direction of your flight? This is the serious question for you to decide, for upon it will depend the success or the failure of your professional life. Will your ambition still carry you up toward the realm of higher professional attainment, or will it gravitate to earth and be satisfied with the commonplace, the sordid, or even worse ambition of the quack and the charlatan?

" But wild Ambition loves to slide, not stand,
And Fortune's ice prefers to Virtue's land."

The noblest ambition is that which desires to *know* and to *do*. Knowledge gives power, and power brings opportunity for the accomplishment of great and noble purposes. It gives opportunity for deeds which in our vocation should bring the blessings of health and happiness to mankind, for this should be and is the highest aim of every true member of the great profession of medicine.

In your professional work be progressive; do not cast aside a theory or a demonstrated fact because it is new. An unbending conservatism or a blind following of precedent are the arch enemies of true progress. The history of medicine from the time of the Egyptians to the present day substantiate this statement. I would therefore advise you in the words of Holy Writ, to "prove all things, hold fast that which is good."

The remark, "There is room at the top," made, I think, by Daniel Webster to a young man who was seeking advice in reference to beginning the study of the law, contains so much of stimulation and encouragement to a noble ambition, and with all is so concise and pointed that it has become almost a classic epigram. I desire, therefore, to impress its teaching upon your minds, for it deserves to be indelibly fixed upon your mental consciousness and

it should be inscribed upon the walls of all of our educational institutions.

This epigram of the great jurist and statesman is as true to-day as when he uttered it, and there is no department of professional endeavor in which its truth is more applicable, than in that of the healing art.

The ranks of medicine and surgery in all of their various specialties, including that of dental surgery, are full and always will be full of commonplace men; men of fair professional attainments but lacking in those elements which mark the true man of science. There is, therefore, no crowding upon the upper rungs of the ladder by which you may climb to professional eminence. Let your motto then be "Excelsior" for "There is room at the top."

The earnest student and the man of ability will usually find encouragement and a liberal reward for all of his achievements. Neither ability nor ambition however, without earnest, painstaking and continuous labor, will ever carry you a single step upward. The history of all great men in every line of endeavor proves the truth of this statement.

Do not allow yourselves to be enticed or carried away by

"A low ambition and a thirst for praise."

but let your ambition be noble and seek to satisfy itself in grand achievements and beneficent deeds.

The great anatomist, physiologist and physician, William Harvey—the discoverer of the circulation of the blood—is a good example of the ambitious, untiring investigator of ability; and one which appeals to every student who has in him the elements of the original investigator and the ambition of achievement to spur him on.

Harvey spent many years in his investigation of the great subject of the circulation of the blood—performing innumerable dissections and vivisections upon the lower animals, studying the mechanism of the heart, the structure of the arteries and veins and in noting the movements of the heart and the flow of the blood in the arteries and veins of living animals—before he imparted his knowledge to his students and friends; but he withheld its publication to the world for nine years longer than he might verify each and every feature of his new and astounding theory.

His discovery was complete in every detail save one, that of the *capillary system of blood vessels*. The demonstration of

these vessels was an impossibility without the aid of the compound microscope, and this instrument was not sufficiently perfected to be of value until some time after his death. The marvel is, however, that he discovered so much of the minute anatomy of the blood vessels with such poor means for investigation, for the only aid to the eye that was within his reach was the ordinary lens or magnifying glass.

The great discovery of the complete circulation of the blood forever did away with the old and absurd notion that the "arteries were air tubes carrying a subtle kind of air or spirit" and that the veins alone carried blood to the various members of the body.

The fact that the heart was the propelling power which forced the blood through the arteries and that the pulsations in the arteries were the result of the rhythmic contractions of the muscular walls of the heart had never before been demonstrated or even suggested. Many other interesting facts which time will not permit to be mentioned, were discovered by this great man.

Harvey had the supreme satisfaction—a satisfaction not always accorded to the discoverer—of seeing his theory adopted by nearly all of the great anatomists of his day, while no name stands higher in the annals of history than that of William Harvey.

John Hunter, the noted anatomist and surgeon, was perhaps the most industrious laborer in the field of original investigation in the whole annals of medicine, and although driven by a constantly increasing practice, he yet found time for numerous lines of original study and research. These investigations covered a wide range of subjects including comparative and human anatomy, physiology, pathology, natural history and surgery. His specimens accumulated so rapidly that he finally built a museum, the upper story of which was devoted to his collection. "Some idea may be formed of Hunter's extreme diligence by the fact that his museum contained at the time of his death 10,563 specimens and preparations," many of them of the greatest interest and value.

Among the most notable of Hunter's surgical studies was that of the treatment of aneurism by the famous operation which bears his name. This operation consisted of tying the artery at some distance from the aneurism but at a point nearer the heart; thus introducing a practice which has been fruitful of most important results in surgery. He is best known however to dental surgeons by his great "*Treatise on the Natural History of the*

Human Teeth," published in two parts, the first in 1771 and the second in 1778; and, as introducing the operation of transplanting teeth from the jaws of one individual to those of another. Several specimens of his experimental studies in this operation are still to be seen in his collection which is now owned by the Royal College of Surgeons, London. These specimens consist of teeth which had been successfully transplanted to the comb of the cock. The anatomical specimens cover almost the entire field of comparative and human anatomy and pathology. The department devoted to the anatomy of the teeth and their pathology being very complete.

Among the other notable writings of Hunter may be mentioned his "Treatise on Venereal Diseases," "Observations on Certain Parts of the Animal Economy," and a "Treatise on the Blood, Inflammation and Gunshot Wounds."

Hunter, like many other great men, was not fully appreciated until after his death. "His contemporaries looked upon him as little better than an innovator and an enthusiast; but he was universally acknowledged by the younger surgeons of his day as the head of his profession."

Edward Jenner, the discoverer of vaccination, is another illustration of the fact that all great men have achieved their greatness by earnest, patient, continuous labor.

Jenner's first thought upon the great question of controlling the ravages of smallpox by vaccination with kine pox, came to him while a student of surgery and pharmacy in a small provincial English town—before he had reached his majority—in a remark made by a milkmaid, who had called to seek his advice. "The subject of smallpox being mentioned in her presence, she observed, 'I cannot take the disease for I have had cowpox.'" This occurred before the year 1770, but from this time onward until the year 1798, when he published his first memoir upon the subject, it became the great and all-absorbing theme of his life.

He began his investigations of the subject by first examining the proofs of the general impression prevailing among the class to which the milkmaid belonged, of the immunibility to smallpox of those who had received accidental inoculation with cowpox.

He next studied kine pox as found among the cows of the neighboring dairies, and came to the conclusion that the disease had its origin in an affection of horses known as grease—a pustular disease affecting the heels of these animals.

The next step in his investigations was a study of the disease as found in persons who were accustomed to milk the infected cows, and discovered a peculiar form of the disease, which seemed to give immunity against smallpox. The investigations upon this particular feature of the subject occupied no less than sixteen years, the crowning experiment being made upon a boy—James Phipps—on May 14, 1796. Many similar experiments followed the success in this case, and in 1798—twenty-eight years after he began his first investigations—he announced to the world his great discovery. Through it, the death rate from smallpox has been reduced in England, where vaccination has for many years been made compulsory, from 21.2 per cent to 0.67 per cent.

The value of this discovery is recognized all over the civilized world, and for almost a century it has been the means every year of saving thousands upon thousands of human lives, and has brought one of the most disgusting, horrible and fatal pestilential diseases known to the human race, entirely within the control of the physician.

All honor, then, to Edward Jenner for a discovery which in its greatness and far-reaching benefits to mankind has never been excelled in the history of the world.

Coming down to more modern times, the names of Horace Wells, William T. G. Morton and Sir J. Y. Simpson stand out as notable landmarks in the history of medicine—Wells, for his discovery of the anæsthetic properties of nitrous oxide or laughing gas; Morton, for his discovery and successful demonstrations of like properties possessed by sulphuric ether, and Simpson, for a similar discovery and successful demonstration of the anæsthetic properties of chloroform.

Anæsthesia is, without doubt, one of the greatest of all the discoveries that have been made in the history of medicine. Only the medical men of to-day whose locks have been whitened by the snows of many winters and whose practice has extended over more than half a century of years, can fully appreciate how great a boon this wonderful discovery has been to suffering humanity. They alone are able to contrast the surgery of to-day and the painless, unconscious condition produced by anæsthesia, with the horrors which surrounded the poor unfortunate sufferer upon the operating table in the days when anæsthetics were unknown.

Wells' discovery as you all know was the result of accident;

he having noticed that a subject who had taken laughing gas for the amusement of an audience, was unconscious of an injury received during the seance. Morton being associated with Wells knew of this discovery, but doubtless saw from the action of the gas that it would not be a reliable means of producing a *prolonged* unconsciousness to pain, was led to experiment with sulphuric ether with the hope of finding something better suited for this purpose. His experiments resulted in the discovery that sulphuric ether was the safer and more reliable anæsthetic for prolonged surgical operations.

But this is not the time nor the place to enter into a discussion of the claims of the disputants for the honor of the first discovery of anæsthesia. It may, however, be safe to say that to Wells belongs the honor of producing anæsthesia for the first minor surgical operation with nitrous oxide gas; and to Morton for producing anæsthesia for the first capital operation with sulphuric ether. In either event, to dental surgery belongs the honor of discovering this great boon to mankind, for both of these men were dentists. One year later—1847—Simpson discovered the anæsthetic properties of chloroform and introduced it into his obstetrical practice. Since this time chloroform has been the favorite anæsthetic in Europe, but in America sulphuric ether has always received the preference. Nitrous oxide gas though still largely used for minor operations like the extraction of teeth, has been generally discarded for all operations requiring any considerable amount of time for their performance.

This trinity of names, Wells, Morton, Simpson, stand out as the triple monument which marks the beginning of the great advancement which has been made by modern surgery. To this trinity the world owes its everlasting gratitude, not only for the beneficent gift of producing unconsciousness to pain, but by making it possible to save innumerable human lives by surgical operations which without the beneficent influence of an anæsthetic it would be barbarous or fatal to attempt.

Perhaps the most notable figure in the history of modern medicine and the allied sciences is that of Louis Pasteur. Though Pasteur was not a physician nor a surgeon yet many of his labors have had a direct and very important bearing upon the science of medicine and his name has become known in almost every intelligent household by reason of his many and important scientific

discoveries; discoveries affecting the health, the lives and many of the great industries of the people.

Pasteur early in his educational training, evinced a passion for chemistry; it is, therefore, not surprising that his first investigations should have been in the field of this much loved science. Later he became greatly interested in molecular physics and crystallography. These studies prepared him to grapple with a subject then agitating the minds of certain great scientists in reference to the polarization of the tartrates and paratartrates of ammonia and soda; Mitscherlich, the great German chemist, having affirmed that they possessed "the same atoms, the same internal arrangement of atoms and the same outward crystalline form, one of them nevertheless causing the plane of polarization to rotate, while the other did not."

Pasteur immediately "instituted a search for facets" upon the crystals "like those discovered in rock crystal, and which without altering chemical constitution destroyed the crystalline identity."

His search was soon rewarded by the discovery of such facets, namely—right-handed and left-handed—upon the tartaric acid crystals and later "proved the neutrality of the paratartrates to be due to the equal admixture of right-handed and left-handed crystals, one of which, when the paratartrate was dissolved, exactly neutralized the other." The honor of discovering this left-handed tartrate belongs alone to Pasteur, and Biot once said to Pasteur on introducing him to Mitscherlich, just after the discovery referred to: "My young friend you may boast of having done something great, in having discovered what had escaped such a man as this."

Pasteur's attention, however, was soon drawn from the study of the abstract in science to the more vital issues comprehended in the yet undeveloped science of bacteriology. In this department of scientific study he is best known to the medical world and in it he has accomplished more perhaps than any one man in this field of investigation.

Prof. John Tyndall, writing of Pasteur in 1884, said: "In the investigation of microscopic organisms—the 'infinitely little,' as Pouchet loved to call them—and their doings in this our world, M. Pasteur has found his true vocation. In this broad field it has been his good fortune to alight upon a crowd of connected problems of the highest public and scientific interest, ripe for solution

and requiring for their successful treatment the precise culture and capacities which he has brought to bear upon them, * * * and in which his labors have rendered him one of the most conspicuous, scientific figures of this age."

Fermentation was the first subject in this line of investigation which attracted the attention of Pasteur and after many years of study and experimental research resulted in the discovery, that all classes of ferments were "living things," and that the substances which had been formally regarded as ferments were in reality only the food of the ferments.

He also discovered that some of these organisms required free oxygen to maintain life; while another group were capable of living without free oxygen, but had the power of liberating this element from its combination with other elements and appropriating it to their use.

The first group he termed *aerobies*, and the latter *anaerobies* and classed all microscopic organisms under these two heads.

Among his other discoveries in fermentation was the *bacterium lactis*, the organism of lactic fermentation; the *mycoderma aceti*, the organism of acetic fermentation; and the *vibrio* of butyric fermentation.

Through the investigations and experiments of Pasteur, the theory of "spontaneous degeneration" was also proved to have been based upon false premises and received its quietus. He stated his convictions in the following words: "There is not one circumstance known at the present day which justifies the assertion that microscopic organisms come into the world without germs or without parents like themselves. Those who maintain the contrary have been the dupes of illusions and of ill-conducted experiments tainted with errors which they know not how either to perceive or to avoid. Spontaneous generation is a chimera." Such men as Tyndall and Huxley repeating his experiments were able to confirm his discovery.

Another series of studies equally important from an industrial standpoint was that of the diseases of wines and beer. These investigations resulted in important discoveries as to their causes and the means by which they might be cured. The cure consisted of racking, bottling and the employment of heat from 55 degrees to 60 degrees C. This discovery wrought invaluable benefits to very important and wealthy industries.

In 1849 an epidemic disease broke out in the silkworm nurseries of the south of France which threatened to destroy one of the most valuable industries of that country. The disease extended, during the next seventeen years, to all the silk-growing countries of Europe and to the far East, Japan alone escaping. In 1865 Pasteur was induced by the Senate of France to undertake a study into the cause of the disease and to suggest, if possible some remedy, as the great losses to this branch of industry, occurring year after year, was becoming a national calamity.

After five seasons of incessant study and experiment, in which he was assisted by his wife and daughter and a corps of assistants, (but which so taxed his energies that he nearly lost his life) he succeeded, not only in discovering the nature and the cause of the plague, but the means by which to successfully combat it. For the success of this great work, which has restored to France and other silk-growing countries one of the most fruitful sources of their wealth, his Emperor nominated him a senator.

Pasteur's investigations into the nature of virulent diseases was the most important of all his work, and brought him into closer relations with the medical world than any of his previous studies

His discovery of living ferments had suggested the possibility of discovering the causes of virulent and contagious diseases. He was so impressed with the possibilities of such a discovery that at the close of his labors upon the diseases of wines and beer he wrote, with the conviction of scientific certainty, "The etiology of contagious diseases is on the eve of having unexpected light thrown upon it."

His first investigations in this field were directed to a study of the dangerous ammoniacal fermentation which takes place in so many affections of the bladder; with the discovery that it was invariably caused by the presence of a microscopic fungus. He next set to work to find a remedy which would combat this fermentation, and discovered that boric acid was antagonistic to ammoniacal fermentation, and therefore recommended to Dr. Guyon, of Paris, the injection of a solution of boric acid into the bladder to control the fermentation and to prevent its development after operations.

This discovery, coupled with the equally important discovery of the causes of fermentation, laid the foundation for the develop-

ment of that great and comprehensive system of treatment known as antiseptics. Lister, seizing upon these facts, and others growing out of Pasteur's studies in fermentation, began (in Edinburgh, in 1865) a series of most brilliant triumphs in surgery, by the application of his antiseptic methods. These methods have since been universally adopted by enlightened surgeons all over the civilized world, and it has become, by its wide range of application, one of the greatest blessings ever bestowed upon suffering humanity, and has made possible the saving of thousands of lives every year which would otherwise have been sacrificed.

This great English surgeon, writing to Pasteur, in 1874, said: "It gives me pleasure to think that you will read with some interest what I have written about an organism which you were the first to study in your memoirs on lactic fermentation. I do not know whether you read the *British Medical Journal*; if so, you will from time to time have seen accounts of the antiseptic system which for the last nine years I have been trying to bring to perfection. Allow me to take this opportunity of sending you my most cordial thanks for having by your brilliant researches demonstrated to me the truth of the germ theory of putrefaction, thus giving me the only principle which could lead to a happy end—the antiseptic system."

Pasteur's labors, however, did not end here, for he had become so impressed with the possibilities of the study of viruses that he determined to penetrate into the causes of that dreadful cattle plague, known as splenic fever or anthrax, which for years had decimated the flocks of France and other countries, resulting in a financial loss of millions of dollars annually.

This subject had been under investigation for years by such men as Davaine and Rayer, Jaillard and Leplat, Koch and Paul Bert without any definite result so far as a positive demonstration of the real cause was concerned, or the discovery of a rational method of cure.

Pasteur was able to prove, after a series of experiments, that the thread-like bodies—anthrax bacilli—discovered by Davaine and Rayer, in 1850, but which they did not associate with the disease as a causative factor, were the real and only cause of the disease; and later he was able to prove the disease was curable by inoculation. During Pasteur's investigations upon this subject he also discovered the bacillus of septicæmia, which had been the

means of misleading the other investigators who had been searching for the causes of splenic fever.

Perhaps the most important of all his discoveries was made while studying chicken cholera. He found that in making artificial cultures of the organism of this disease, that after a pure culture had been obtained, its virulence, after a certain period, decreased with its age; so that fowls inoculated with a pure culture which was, for instance, three months old, were not killed by it (as they would be if inoculated with a culture only twenty-four or forty-eight hours old) but were only rendered more or less ill by it. If, after they had recovered from this inoculation with the old culture or attenuated virus, they should be inoculated with a pure culture, one or two days old (a virulent virus) "capable of killing its 100 per cent," these fowls would be made ill, but would eventually recover. Pasteur's conclusion was this: "The disease can protect from itself," or, in other words, inoculation with an attenuated virus would render the fowl immune to a subsequent attack of the disease.

Another important discovery growing out of Pasteur's studies in the attenuated viruses, was the fact that hydrophobia in animals and in man might be prevented, by rendering them immune to the infection by inoculations with a specially prepared virus; and that the disease itself could be prevented from developing in those who had been infected by the virulent virus if inoculations with the attenuated virus could be instituted immediately after the animal or person had been bitten by a rabid animal.

Upon this discovery of the attenuated virus and the accumulated evidence of a century, upon the value of Jenner's discovery of vaccination with kine pox, coupled with the success attending inoculation against splenic fever; the marvelous results of antiseptics in surgery, and of inoculation in hydrophobia with the attenuated virus, has been built the hopes of Pasteur and that rapidly growing body of earnest delvers after knowledge in the fields of bacteriology and therapeutics; that the day is not far distant when all infectious and contagious diseases shall be brought under control by like measures, and eventually stamped out of existence.

These hopes are already being realized in tetanus and diphtheria, by the antitoxin treatment. The mortality in tetanus which was originally about 88 per cent has been reduced to 20 per cent,

while in diphtheria, there has been according to some authorities an equally great reduction in the death rate.

Prof. Tyndall writing to Pasteur in 1876 said: "For the first time in the history of science we are able to entertain the sure and certain hope that in relation to epidemic diseases, medicine will soon be delivered from empiricism, and placed upon a real scientific basis.

"When this great day shall come, humanity will recognize that it is to you the greatest part of its gratitude is due." All honor then to Louis Pasteur for his great scientific discoveries and for the invaluable benefits which they have brought to mankind.

The contemplation of the achievements of such men as these; men who sacrificed personal enjoyment, and were willing to sacrifice even life itself that they might bring health, comfort and prosperity to their fellow beings, should not only command our respect and veneration, but should stir within those of us who are also collaborators in the fields of science, a supreme ambition to emulate their deeds.

"Yet all may win the triumphs these have won."

These men, and that great army of others who have labored in the fields of science for the discovery of the laws which govern the organic and inorganic world, and their application to the physical needs of the human race in health and disease, often conducted their studies under circumstances of great personal discouragement, and were many times obliged to surmount difficulties, which to less enthusiastic laborers seemed well nigh insurmountable; and yet by earnest, constant and intelligent effort, their labors have been crowned with success, or failing in this, they have been able through their experience and disappointments to point the way to success, to those who have followed them.

Do not imagine, however, that because so many brilliant discoveries have been made in the past, that there are now no opportunities left for achieving greatness in the field of science, for such is not the fact. The field is large and the opportunities many, to those who are willing to delve. Never in the history of the world has there been such activity in the field of original study and research; never has there been so many well-trained minds brought to bear upon the numerous unsolved problems in medical science; never have the prospects been so great for their correct solution, as they are to-day.

All honor then to those grand men of the past who working against great odds, achieved so much, and have made it possible for those who come after them to discover what was hidden from their eyes. All honor to those who are at the present day delving into the hidden mysteries of the unknown in science; mysteries which shall eventually be solved, thus making the names of these laborers worthy to be written upon the same page in history with those of Harvey, Hunter and Jenner, Wells, Morton and Simpson, Pasteur and Lister.

ADDRESS.*

BY C. N. JOHNSON, L. D. S., D. D. S., CHICAGO, ILL.

Members of the Graduating Class, Ladies and Gentlemen:—A band of pilgrims were once assembled at the foot of a high mountain preparatory to starting on a journey to a distant shrine. A difference of opinion arose as to which way should be taken. The shrine lay just beyond the summit of the mountain, and a few of the select contended that the surest way to reach it was to push straight up the mountain side in a direct line for the summit. Others said that this route was altogether too difficult, and that an easier way presented itself in the by-paths which circled around the foot of the mountain and promised a more gradual ascent to the shrine on the other side. So there was a division. Those who sought an easy way of reaching the goal sauntered leisurely along the winding paths, beguiled by the fragrance of flowers wafted across the valleys and meadows of the lowlands. The others, turning their faces toward the frowning summit, started boldly up the rocky mountain side.

Following the fortunes of each of these divisions, we find the former lured away into a maze of endless and purposeless by-ways which led in every direction, and yet never seemed to reach anywhere. When night befell they were confused and lost, and were further away from their goal than when they started in the morning. It is needless to say that they never reached the shrine.

The pilgrims who marched straight up the mountain had a hard and rocky road for their portion in the early stages of the journey. Pebbles rolled beneath their feet, and the glare of the

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sun beating down on the mountain side threatened to blind them in its intensity. They became thirsty, worn and footsore. Yet they struggled on with eyes bent bravely toward the summit, and with the hope in their hearts that victory must in the end be theirs if they turned neither to the right nor left. And at even-tide, when the slanting rays of the western sun were bathing the summit of the mountain a rosy hue, the forms of the pilgrims stood outlined against the distant sky and before them at their very feet appeared the object of their worship.

Risking the charge of displaying a somewhat vivid stretch of the imagination in comparing the average class of dental students with a band of pilgrims, I am yet impelled to believe that there is much in common between you young men assembled here this evening and the travelers to whom I have just alluded. You are starting out on a journey, and the ultimate result of your travels must depend upon the course you take and the perseverance with which you follow out that course to the end. The indulgence of fate in your case, as with the pilgrims, lies in the fact that to you it is given to select of your own free will whichever route you are to take. No one may make this selection for you. In your own hands lies your future destiny.

I have been invited by your faculty to say a few words to you to-night on the eve of your farewell to college walls, and your advent on the scene of active professional life; and I approach the duty with more or less misgiving. It has been my fortune to deliver many addresses of this nature, but I never yet appeared before a class of students under such auspices as these without being overwhelmed with the limitations which prevent a speaker from saying the words that shall burn into the very consciousness of his hearers, and direct the tenor of their whole future lives.

I have said that you are just starting out on a journey. In the light of your years of studentship; the weary hours of work at the desk, in the laboratory or over the chair; the unceasing and unselfish labors of your professors in your behalf; and all followed by the stress and strain of a successful final examination; I doubt not that most of you would naturally contend that you had at least passed the first stage on the journey. But I wish to correct any such possible impression. All of this work has simply been preparatory. Not one step on the real journey has been taken. Some of you are better prepared than others, but all are supposed to be

sufficiently equipped to enable you to undertake the journey with the assurance of ultimate success, provided you map out the right road and then have the perseverance to follow it.

My office here to-night is to point out to you as best I may what I conceive to be the surest way to success. In so doing it may be well to consider for a moment what constitutes success. Wealth is not necessarily success, though the modern rush of the millions to worship at the shrine of the fickle god Mammon would seem to indicate that this was the end and all of human attainment. Fame is not success, despite the pitiable clamor that men are making on every hand to write their names high on the sign boards of notoriety, where every one who runs may read. High offices and preferment do not constitute success, though the politicians and place seekers would appear to inscribe this as the cardinal principle of their faith.

In speaking thus I am making no arraignment of either wealth, fame or official distinction. Each of them, or all of them, may properly be sought through legitimate channels, and no man is the worse for their attainment provided he has other and loftier aims in life to which these are tributary. But the vitiation of the age seems to impell men to the pursuit of those things which relate principally to their own personal gratification or aggrandizement.

Wealth attained in the proper way and put to the proper use is powerful for much good, but wealth accumulated through questionable methods and utilized for sordid purposes is a curse to the man who possesses it. Great wealth is always a great burden no matter how obtained, and no man should own more than he can comfortably control and utilize to the best advantage. When wealth gets beyond that point the ownership changes hands and the money owns the man. There is no more miserable creature on earth than the man of immense wealth with no object in life save the guarding of his dollars. He is the prey of every trickster and the butt of every mean motive. Better be at the bottom struggling for the top, than at the top dizzy with the fear of falling.

It may seem exceedingly far fetched to speak to a class of dental graduates on the evils of great wealth. The possibilities of attaining wealth through the practice of dentistry are so remote that such philosophy as I have just indulged in may appear out of place in an address of this kind. And yet in my relations with

professional men I have thus far failed to detect in them any degree of high minded immunity from the same abnormal desire for wealth that comes so nearly proving the common curse of modern humanity. Especially does the young man, starting out in practice, seem to direct his every energy toward this one attainment. The desire to accumulate money rapidly has wrecked the professional reputation of many a promising graduate, and while I say no word here to-night to discourage any one of you from laying aside a competency for your old age, I yet feel impelled to warn you not to jeopardize your future by attempting too short a cut to wealth.

Neither must you struggle too strenuously after immediate fame or official recognition. Let your reputation be founded on a substantial basis, and then let it grow naturally and gradually. A reputation which springs up in a night is likely to vanish with the rays of the morning sun.

But I was to tell you what constitutes success. Happiness to my mind is the real measure of success. A man is not truly successful in this life unless he is reasonably happy. We cannot be happy all the time, but we can try to be happy most of the time, and we can try all the time to make some one else happy. The successful man is he who at the close of each day may truly affirm, "This day have I added to the sum of human happiness." He who labors for the welfare of his fellowman in whatsoever capacity in life his lot may be cast has the greatest assurance of happiness for himself, and the best title to being called successful. In this view of the case you young men have much to be thankful for. You are just entering a profession which gives you unlimited capacity for future usefulness to the human race. If I can impress upon you to-night the importance of the calling you have chosen, if I can show you wherein you may serve humanity to the best advantage by the proper practice of your profession, if I can instill in your minds the seriousness of the mission you have to fulfill in the great heaving, seething ocean of human suffering, then I shall have gone far toward pointing out the surest way to your future success.

Dentistry offers the opportunity for the development of the highest and purest traits in a man's character. It remains for you to make the most of that which your profession offers. If you content yourselves to remain where you are at the time of graduation,

then you may expect to sink into a mediocrity which shall bury you in oblivion. There is no mediocrity so narrow as dental mediocrity. The legal pettifogger, the medical pill mixer, or the clerical nincompoop are men in stature beside the dental putterer. Be something in your profession or else get out of it. Better be a good sewing machine agent than a poor tooth tinker. In this day of inventive genius and great material achievement the world has small place for the sluggard.

The possibilities of dentistry relate not alone to its beneficence in the way of relieving human suffering, though this of itself might well commend it to a place of honor among the professions. Its artistic attainments along the lines of harmonizing and beautifying the human features are rapidly being recognized, and thanks to modern dentistry the toothless jaws of old age no longer sink drooping away into helpless collapse, bearing the infallible trademark of infirmity. But probably the highest service that dentistry renders humanity is in the direction of preserving the natural organs through life. Given an expert and conscientious dentist, and place in his hands the care of the teeth of the average individual with full control of all the methods of procedure, and the individual thus served may take to the grave his full quota of teeth. Is there any higher service in the ordinary walks of life than this?

But to be able to render this kind of service a dentist must be possessed of the most sterling qualifications. It has been remarked, and with much truth, that the practice of dentistry in its loftiest ideals requires a more diversified talent of a high order than that of any other calling. A well qualified dentist must be a master mechanic. He must have it in his fingers to execute the most difficult and intricate of manipulative procedures. He must possess the fundamentals of civil engineering, and be familiar with the relations of stress and resistance. He must also be an artist of the very broadest type, having an eye for harmony of colors, for grace of outline, and for perfection of symmetry. He must be a creative genius—one who can evolve brilliant conceptions of forms and figures. He must be a man of rare judgment and quick decision, cool of nerve and definite in his ideas. He must have the instincts of the healer, the soother of pains, the quieter of fears. His touch must be tender, his manipulation firm. He must be possessed of a high order of intellectuality, and be discriminating in his tastes. He must be high minded to an exalted degree. He must study

human nature in its varying manifestations of temperament till he can read it like an open book. Above and beyond all he must display the attributes of a cultured gentleman, and be known among men as an individual claiming the confidence of all whose confidence is worth having.

And now to you young graduates assembled here to-night I bring the message that for such men as I have indicated there awaits the welcome of an appreciative profession and a grateful public. The profession of dentistry is not so old that it has become envious. We who are in the ranks are happy to extend the right hand of fellowship to those who are just entering. There is always room for good men in any calling, and we venture the hope that in every one of you there is the making of a good man. Your professors have labored earnestly to perfect you in all the advanced teachings of your chosen profession, and they are ambitious for you to become something more than mere manikins. They are hopeful that each of you will map out his individual course along the lines that shall insure the greatest measure of usefulness and reputation in the profession. May your future prove that this hope is well founded.

Let me admonish you to identify yourselves with the better element of the profession from the moment of your entrance. There is an *esprit de corps* among dentists that you cannot afford to do without. All well-meaning men in any profession have interests in common which relate to other things than those of a mercenary nature. There is something kindred in a common service of humanity, and this sentiment grows stronger as civilization advances. I come to you here this evening from a distant State and I look into your faces for the first time, but you and I are not strangers. We are bound together by the sentiment of kindred aims and objects, and by the affections which gather around the traditions of an honored calling. There is something subtle but no less certain in the pulse beat which vibrates in unison among the members of any profession. We do not need to know a man personally to be assured of his friendship. We feel the impulse of a common purpose in life when we see in the mouths of our patients the handiwork of other men. One operator in San Francisco may do a beautiful piece of work for his patient, and that patient in the course of events may subsequently sit in the chair of a dentist in New York. When the New York man sees

this evidence of artistic skill on the part of his fellow practitioner in San Francisco, his heart intuitively warms toward him, and he is interested in the patient's smallest word of reference to his personal traits and tendencies. That one piece of work has carried a handclasp across the continent. Several years ago one of my own patients was traveling in Europe, and while in Germany chanced to require some dental service. She went to a man of whom I had never heard, and whose name I cannot now recall; but the word she brought to me of his remarks on some of my operations made me feel that I had a brother in Berlin.

And so to you young men I have the promise that your work will receive appreciation if only you keep it up to the highest standard. This does not suggest that you can always hope to attain uniform excellence. Failure and disappointment will come at intervals all too frequent, but the constant endeavor to achieve perfection will raise you to a higher plan of accomplishment than if you content yourselves with mediocrity. Every honest effort to do a perfect piece of work will render the execution of the next piece easier. If you apply yourselves continually to the performance of the highest grade of service it will become a habit with you to render this kind of service, and eventually you will find it as easy and natural for you to do good work as it otherwise would have been to do indifferent work.

But I must not preach you too long a sermon. The many words of good advice you have already received at the hands of your teachers through your college course will far outweigh anything that I might say in the brief span of a single address, and I must content myself with extending to you my congratulations on your entrance to a worthy profession, and my sincerest good wishes for your future success.

May it be yours through life to taste the sweets of high accomplishment. May you win the respect of the observant few, if not the plaudits of the crowd. May your earlier life be filled with the perfume of promise, and your declining days mellowed with the ripened fruit of attainment. May the cares that cross your path tend to broaden you and make you better men, and may you bravely face any adversity that perchance shall fall upon you. In the quiet walks of life where every man's true destiny is measured—in the family circle, around the hearthstone, and beside the tiny cot—may it be yours to find a refuge from the storms of the outer

world, and may your heart never fail to beat in unison with the hearts of those with whom you go through life. May your years be long and happy, and when the last day's work is done, when the final shadows flit about your evening couch, may you lay your head to rest amid a pillow of perfumed flowers, and hear the birds in the branches overhead chanting a chorus from the anthem of a life well lived.

I bid you all hail, and good cheer.

THE MOUTHS OF OUR SCHOOL CHILDREN.*

BY CARL THEODORE GRAMM, M. D., CHICAGO, ILL. PROFESSOR OF ORAL SURGERY, COLLEGE OF PHYSICIANS AND SURGEONS, KEOKUK; ATTENDING STOMATOLOGIST, MICHAEL REESE'S HOSPITAL, ST. JOSEPH'S HOSPITAL, UNITED HEBREW'S CHARITIES DISPENSARY; LECTURER ON STOMATOLOGY, ST. JOSEPH'S HOSPITAL, TRAINING SCHOOL FOR NURSES, ETC., ETC.

I come to you to-day with a plea for your interest in what to the youth of our land is a veritable Pandora's box. I refer to the universal existence of malformation of the oral structures and their vulnerability, sometimes initiative and sometimes coexisting with constitutional and local disorders, and always conducive to a lowered physical and mental vigor. I claim your interest in this my theme, since you, as practicing physicians, enter the sanctum sanctorum of nearly every home and are in a position to be doctors indeed, that is, teachers there of prophylaxis. And prophylaxis with children applied to physical development and to character formation means so much to future generations, families and nations.

Why are there so many mouth breathers in our school rooms, boys and girls, whose nasal secretions have become vitiated, whose unused nasal passages have become clogged with abnormal growths, very much like vacated country lanes grow up to weeds, whose throats and lungs have become congested because of unfiltered and untempered air inhaled, whose chests have become contracted and shoulders stooping, whose physiognomies, once bright and intelligent, have altered, expressing merely weakness and

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stupidity; in short, whose whole physical and mental condition are markedly depressed. What is at the bottom of it? Answer—ignorance or neglect.

Why is it that so large a percentage of our children, school children, the children who come to our clinics, present features distorted, due only to untimely, injudicious loss of teeth, deciduous and permanent? Because of ignorance or neglect.

Why in this day of asepsis should we meet with cases of gastritis innumerable, due to filthy and diseased mouths? Why so much stomatitis, so many cases of alveolar abscesses, vitiating the system of the developing child and leaving an impress upon the general connective tissues often not to be eradicated? Again, the same answer.

The fact is that these conditions could be avoided by timely guidance and advice; and it is a pity that so many human beings are allowed to become disfigured and are subjected to torture when the ounce of prevention might have secured them against future discomfort. This ounce of prevention, this timely counsel, may come most forcibly and naturally from the physician for reasons which I stated at the outset.

Wherefore this plea, that the medical profession should interest itself in what has hitherto been a somewhat disregarded field for it? It is only in recent years that oral pathology has been taught in a few medical schools; and even to-day the attendance at these lectures is not compulsory. Trained nurses, as a rule, have no conception of the care of mouths of those whom they are attending, and the overwhelming majority of mothers are lamentably indifferent and untutored in the care of their children's mouths. One of the principal points of my plea, therefore, is for the maintenance of a chair or a lectureship in every under- and post-graduate medical school, teaching this specialty of medicine, which cannot any more be relegated to barbers and blacksmiths—a fact due to the magnificent development of dental surgery, brought about by educated, broad, brainy members of the dental profession. These, unfortunately, can serve and educate but a number of the great public needing instruction in oral hygiene. I plead that every training school for nurses should include the subject in its course. I would plead, furthermore, that teachers in our public schools be instructed not to be content with having merely hands and faces clean. It ought not to be implied by them

that only the exterior—that which shows—must be clean. Without going to extremes, their ethic might be grounded more thoroughly and our children be compelled to come to school with the teeth also cleansed. The mouth is such a common receptacle for all manner of bacteria and, when neglected, becomes such an excellent nidus for many that are pathogenic that cleanliness of it should be enforced wherever it may be.

This brings me to an aside, namely, that the friendly exchange of half exhausted chewing gum on the part of children ought to be discouraged, and with it the practice of teachers (almost as bad) of distributing promiscuously to the classes penholders and drawing pencils which had been handled and mouthed and infected by others the day before.

This was the practice in my early youth, and I learn with disgust that all the scientific advancement in practical medicine has not caused this dangerous custom to be banished.

If the medical profession will awaken to the close relationship of oral neglect with general disease and in accord with stomatologists endeavor to prevent this neglect and the harm arising from it, cuspids will be allowed to remain as the keystones of the dental art and facial expression. The first molar will remain to develop the lower half of the face, deciduous teeth will completely fulfill their original mission, pus absorption from dental abscesses will be a thing of the past, mouth breathers will follow Shakespeare's injunction—"Shut your mouths, and stretch your nostrils wide." Our children will be healthier and happier.

103 STATE STREET.

THE REMOVAL OF DEPOSITS UPON TEETH.*

BY I. A. FREEMAN, D. D. S., CHICAGO, ILL.

In bringing this subject before the Society it is not the intention to discuss the subject of pyorrhœa alveolaris as such, but the removal of deposits which are analogous to it; neither is it intended to treat of the different kinds of calcific concretions, or the causes of these deposits found upon the teeth to great extent. Deposits are defined as "that which is deposited, thrown, or laid down, especially matter precipitated from a solution in water or any other liquid."

*Read before Chicago Dental Society.

Various authors give the origin of the calcific deposits found upon the teeth as being the saliva and that of the blood serum. Climatic influences govern to some extent the amount and rapidity with which this deposit is made. In a warm climate with dry atmosphere there seems to be far less accumulation than is found upon the teeth of people inhabiting marshy and damp regions, and who, as a result, are also troubled with malarial affections. Those persons who are poor eliminants of the waste products of the system are more subject to these concretions than those who are known as good eliminants. Age has its influence. For instance, when the osseous structure is completed there seems to be less demand for the lime assimilated from the different foods, and the secre-



ILLUSTRATION A.—Showing Dr. Harlan's instrument in position for the removal of deposit upon the root, situated near apical end, force exerted toward the apex.



ILLUSTRATION B.—Showing instruments in position for the removal of calcific scales upon root of bicuspid. Dr. Cushing's force being applied by traction toward the cutting edge; also Dr. Harlan's force exerted toward the apical end of root.

tions become loaded with it. Now, with poor elimination the presence of carbonic acid as waste in the secretions gives to them the solvent properties, so that they are loaded with lime salts, and as a consequence in different cavities of the body are found these products, stone in the bladder, gall stones, calcific deposits on the teeth, etc.

Pathological conditions have a varying influence upon the amount and the rapidity of these accumulations. That which is the more rapidly deposited is, as a rule, soft and of light color, while that which is less rapidly laid down is very hard and dark in color. Where there is a rapid development of calcific concretion

the patient will usually find it necessary to seek relief from the dentist frequently. In this way one of the causes of the dark, hard variety is removed, namely, the action of time. The solidity or hardness and color being the result of long standing, habits, etc., it not being deposited rapidly, is less irritating to the tissues, and hence does not drive the patient to the dentist so early on that account.

Now, there are several means suggested for the removal of these deposits. If a solvent could be found that would not be injurious to the tooth substance and one sufficiently powerful to cause the softening of this substance known as salivary calculus it would indeed be a great boon to the people. It is said that carbonic acid is a good solvent of lime. Possibly carbonized waters, as furnished for soda fountains, might be found beneficial as a wash for the mouth. It may be that by constant use it would lessen the accumulation, but might not prove to be as helpful as some other kind of acid. Aromatic sulphuric acid is favored by some both as a stimulant in pyorrhœa pockets and also as a solvent of lime which may be left after surgical interference.

Dr. A. W. Harlan has suggested trichloroacetic acid in dilute form as being both safe and helpful as a stimulant, and also solvent agent, to be used after removal of the deposit by instrumentation.

At a meeting some time since Dr. Younger said he used the commercial strength of lactic acid for the purpose of dissolving the small particles of serosal calcific deposits that may have escaped the instrument. The tincture of iodine has been suggested and used as a solvent of these deposits, especially that of green stain found upon the teeth of children. Iodine in other forms has been used with electricity, the theory being that during the decomposition of the iodine salt by the electricity an electrolytic action was also had upon the lime salts present in the nodules or scales upon the teeth. I have to confess that I have had but a very limited experience with these agents, and I depend mainly upon surgical interference in my practice, using instruments such as are found in our dental depots in great variety. And here I desire to say a word concerning the instruments provided for this purpose, comparing them with those found in the dental depots thirty years ago. At that time the instruments were very crude, heavy and totally unfit for the purpose intended. It was said that Rigg's dis-

ease, now known as *pyorrhœa alveolaris*, was incurable, and I believe was rarely ever treated, as with those instruments it was impossible to remove deposits that were situated beneath the gums without severely torturing the patient.

While to-day we are provided with beautifully constructed instruments, and it is quite possible to reach and remove the scale or nodule, though it be well-nigh situated at the apical extremity

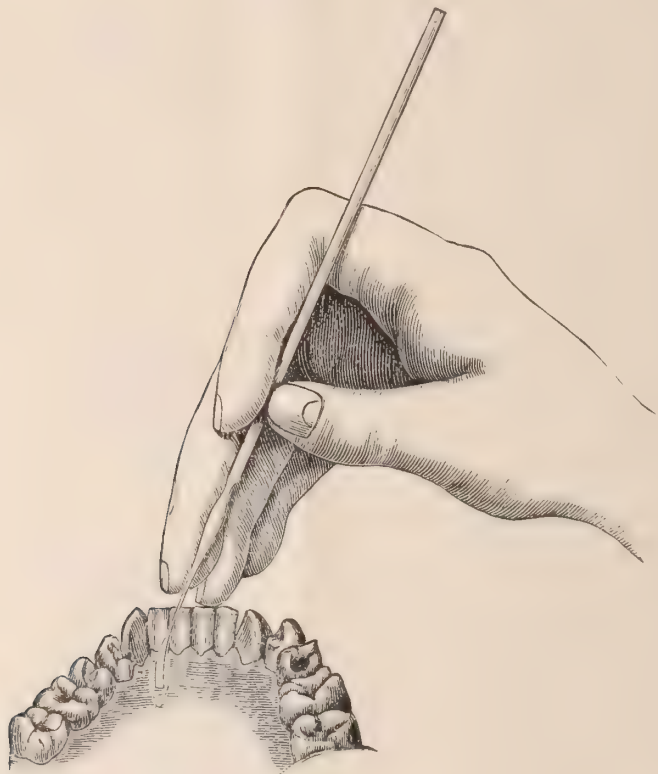


ILLUSTRATION C.—Showing position of instrument, also rest for hand while force is exerted for the removal of deposit.

of the tooth. And then we had not at that time that other agent which is so helpful and so full of relief to the patient—cocaine. Surely along this line dentistry has made one of its greatest advances. The set of instruments suggested by and known as Dr. George H. Cushing's set of scalers or cleaners with those forms added by Dr. Harlan, as now manufactured, are the most ideal of

any, although there are many forms suggested by others that are very helpful and important adjuncts to those mentioned, and I presume each dentist has some forms of instruments of his own device which he regards as indispensable in his practice and are to him the great desiderata.

We come now to consider briefly some of the preliminary steps in removing deposits upon the teeth. I think it will always be best to first take observations, that we may come to a knowledge of all the conditions. What kind of deposit we have to deal with, whether it be that which is rapidly deposited, soft and quite easily removed, or of the dark hard variety; for, if of the former, then the time necessary for the performance of its removal will usually be less than if it be of the latter. Then the form of the teeth should be taken into consideration, whether large, bell-shaped crowns, or short, small, and of conical form, whether irregular or well arranged in the dental arch, if in close contact, if the denture be complete, if there be considerable recession of the gum, (for the extent of this lesion will have a very considerable influence on the facility with which the operation may be done.) These are some of the points which we will do well to observe, for there will scarcely be any limit to the degree of thoroughness demanded in the work to be undertaken.

The operator should always first become acquainted with the case he has in hand and prepare himself for the accomplishment of the work desired. I think it best that the patient be informed with regard to the importance of the operation and the amount of labor necessary for its accomplishment, so that the operator may feel free to make such reservation of time either for a continuous sitting, or for subsequent sittings that a perfect work may be the result. I think that the time used and the physical exhaustion in properly cleaning a set of teeth which are affected by any considerable extent or amount of deposits upon them, and the subsequent treatment of the gums and teeth are the least appreciated in importance by the dentist himself, and as a consequence by his patient, of any of the operations that we as dentists are called upon to perform.

I fear that we have not, as a rule, been thorough enough, or have not used anything like the time we should to accomplish the object sought, namely, the cure and eradication of the disease or trouble. One reason why some dentists are always busy and have

their time fully engaged in advance is doubtless because of their exhaustive painstaking in all operations submitted to them. The fact is, we should never be in a hurry about our work. If our patient cannot give the time necessary to complete an operation at one sitting I believe we should arrange for and do only such a part as can be done perfectly in the time set apart for them. For instance, if you cannot get your patient to sit for only the time which will be required to clean one tooth in the most thorough manner, why do that and not attempt more; then proceed with the surfaces adjacent or next to the one so completed, but not to leave the first until you have done with it. It may be urged that the hæmorrhage from wounded and bleeding tissues will cover up the deposit to be removed, so that the work will be greatly hindered if confined to one locality. In reply to this, I would say that the smaller the area so wounded, the less will be the hæmorrhage and obstruction, and then with proper preparation we can control it to a large extent.

And here we come to consider the preparations for the performance of this work. And, first, the patient seated in the operating chair should be carefully protected from soiling the clothes by placing towels about the neck and lap. Instruments should be sterilized and so placed that they will be within easy reach and should be of sufficient variety to reach all surfaces as readily as possible—whether regular or irregular, whether in close contact or well separated. These instruments should be of metal throughout; wood and ivory handles should be discarded. There should be at hand a good large syringe for the purpose of washing away the dislodged particles; care should be taken that all calcific spiculæ be removed, for if left in contact or within the soft tissues they will become a source of irritation. There should be at hand rolls and pellets of absorbent cotton and folds of bibulous paper, with which to absorb secretions consequent upon the disturbance of the tissues and excitation of the salivary glands.

A mouth mirror, which has been warmed either by a bath in warm water or by dry heat, so that condensation of moisture from the breath upon it may be avoided, two or three silver probes of different forms and sizes should be at hand to be used as explorers of the surfaces beneath the free margin of the gums, by the delicate manipulation of which one may become an adept in their use, so as almost to see by them. Indeed, as in other departments

of surgery, they are the eyes of the operator to discover the hidden nodules or scales, roughened surfaces, or ragged alveolar borders. Now, for this delicacy of touch so necessary for the detection of these minute particles of calcific deposits, the fingers must be well cared for, should not be roughened by manual labor or toughened by the handling of hot metals or the hot end of a cigarette, or otherwise made incapable of that sensitiveness necessary to reveal the most slightly roughened surface upon the teeth or the parts the probe may come in contact with; for if we expect to succeed in our endeavor to cure the case we have in hand, we must discover and remove every particle of foreign substance, concretion or deposit.

But there is another instrument needed to be used in treating the parts before we can even approach in many instances the hidden offending nodule, so great is the pain caused by forcing away the gums, swollen and so sensitive do we often find them in pyorrhœa cases. These tissues must be anæsthetized before operating upon them and a syringe of delicate construction to carry a mild solution of cocaine, preferably a 2 to 4 per cent cent solution, well down into these pockets should be at hand. Folds of bibulous paper should be placed about the parts so as to take up the excess which may escape from the pocket and thus prevent its absorption by other parts or tissues. With these preparations at hand we are ready to proceed, and having selected the tooth upon which to begin the procedure, which will, of course, depend upon what are the conditions; the extent of this lesion has developed. Those instruments which reach the exposed parts most readily will first be required. For instance, if upon the lower incisors, a long curved instrument used by exerting force toward the gum margin along the lingual side is the form of instrument usually preferred, the third and little finger resting upon the cutting edge, thus guarding against undue injury, should the deposit be suddenly dislodged.

The mallet may here be used when the force required to dislodge the scale be unsafe by hand pressure alone, which is sometimes the case when the dark, hard variety are to be removed. When this surface has been cleared, other very thin instruments, sharpened to an edge, may be pushed through from the labial aspect, and in this way the lateral sides may be cleaned. As an instrument to supplement these a broad, thin hatchet-shaped instru-

ment may be used with good results from the lingual aspect. When the labial surface needs treatment a straight thin instrument with force exerted from the cutting edge toward the cervix is best. These instruments will be found sufficient in an uncomplicated case, but should the deposit be beneath the gum upon the labial or lingual surface, it will be found necessary to have other forms and more delicate instruments. These are found in the set advised by Dr. Cushing, and those known as Dr. Allport's pyorrhœa set.

For the removal of deposits situated beneath the gum margin to the apex, instruments that form a short right angle to the shaft will be found best adapted, and are to be used by carrying past the nodule, when by pressure toward and upon the root and traction made toward the cutting edge, the right angle end or edge, catching up and removing some portion of the deposit with each motion or traction. By repeated and persistent efforts the deposit may be removed and the rough surface be made smooth. Of course, other instruments will be found helpful; sometimes the scale may be removed entire by the long, thin, curved instrument suggested by Dr. Harlan, the force being exerted toward the apex.

After the various surfaces have been cleared of the large mass of calcific matter, the use of finely pulverized pumice stone should be applied by means of rubber cup discs, moos-hide points, wood points, etc. Brushes are helpful and have their place. Along the root, beneath the gum, a piece of soft pine or white wood will carry the powder, and by rubbing carefully will sufficiently smooth those surfaces. After, and frequently during this procedure the use of the syringe should be had with a mixture of some antiseptic in warm water, preferably Black's 1, 2, 3 in alcohol and glycerine—1, 2, 3 ℥i , alcohol ℥iij , glycerine ℥ss . Use ℥i in one glass of water. This makes a very pleasant wash for the patient to use. The syringe should be one upon which sufficient force can be applied to wash away the powder and debris and coagulated blood, etc.

This will constitute the typical procedure and sufficiently indicate the treatment of this lesion, except where a surgical operation is indicated. Of course, there are difficulties attending the treatment of each individual tooth, for which special instruments will be needed to be able to reach all surfaces, and the ingenuity of the operator will be brought into play to overcome them; but he must be patient and persistent, especially with the molars where

each root must be treated as an individual tooth, and where the advantage of everybody's effort to produce an instrument for rendering each difficult operation as simple as possible will be duly appreciated.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held March 2, 1897, the President, Dr. Louis Ottofy, in the chair.

Dr. J. W. Wassall read a paper by Mr. W. Booth Pearsall, of Dublin, Ireland, entitled, "The Dental Museum."

Dr. G. V. Black was called upon to open the discussion.

Dr. BLACK said: *Mr. President*: Unfortunately I came in late and only heard the end of the paper, and I am hardly prepared to discuss it for that reason. This matter of preserving specimens is very important and I feel that we should consider it faithfully. Much good material is being destroyed every year for the want of some means of taking care of it, and anything of the kind outlined in the paper I shall certainly welcome most heartily.

Dr. J. G. REID: The only point I wish to mention in connection with this subject is this, that if the paper presented is considered to be entirely new in this particular line, I should say that it is not, because in visiting the Museum of the Dental College of Cleveland we will find just exactly such an arrangement as has been presented in the paper. It is almost identical, with the exception of that referring to casts or larger specimens, but the specimens of teeth which are said in the paper to be enclosed in glass bottles or tubes have been minutely and carefully described and presented in the institution of which I have spoken. I saw about 1,500 smaller specimens of teeth that were arranged in the manner mentioned in the paper and classified under each head in the museum at Cleveland. Pursuing the same idea and following out the line of instruction laid down in the paper, it seems to me it is a very valuable addition to curators and collectors of specimens. We have some curators with us to-night and doubtless they might give us some information.

Dr. GARRETT NEWKIRK: I do not like to let a paper of this kind pass without more words of commendation. In all of my associa-

tions with dental societies I have never heard a paper along this line that in any way compared with it for practical illustrations of the subject in hand. It is not only a valuable contribution for curators of museums, but it is exceedingly valuable for individuals who may choose to adopt some such system for their own private offices. It is something which to a limited extent can be used by anybody, and I should say the young men particularly in the profession ought to take an interest in this work and begin now, and not wait until they are as old as I am. They can each one of them secure a nice collection, which would be not only interesting and instructive, but very valuable. It seems to me in this paper we have a very clear, accurate, and excellent illustration of the best methods known to date for the preservation of specimens. I am very much pleased with the paper and thank Dr. Wassall for having given it.

Dr. D. M. CATTELL: I feel grateful for the paper and the suggestions contained therein. I have hundreds of specimens and have been waiting for some method of arrangement to present itself to my mind in order that they may be so placed as to be seen to better advantage. It is true, many of us, probably all of us, have a few specimens laid away in bottles for safe keeping, but the idea of placing specimens in bottles or tubes, and having the tubes labeled and systematically arranged in cases as described, is good and feasible, and I feel under obligation for the suggestions made. I am sure they will help me out in systematizing my little museum.

Dr. J. N. CROUSE: I think the paper will be of value in the line of encouraging practitioners to take better care of their specimens, if for nothing else. If I went back thirty years and should adopt the system, which I attempted to do very imperfectly and abandoned it, of keeping casts of all mouths of children that came into my hands on up to adult life, by this time I could have had a dray full of casts, but it was difficult to properly take care of them. Somebody came along and dumped them into the laboratory, and by and by some of them would get broken, and I have not yet found any one who would so arrange and classify these casts as to be of use to dentists afterward. I believe, however, if the practitioners of the future will take impressions of the mouths of their patients and keep casts of them and see what changes have taken place as they advance in years, they will work more intelligently than we do now.

Dr. J. H. WOOLLEY: The suggestion of Dr. Crouse is a good

one. I recollect a number of years ago to have had a child ten or twelve years old brought to me by its mother to have its teeth regulated, and in looking over the case I came to the conclusion that nature would do as much for the child as it was necessary to do. In the meantime I took an impression of the mouth, and at the end of four or five years I took another impression, and later still a third impression. The idea suggested to me was that my diagnosis was correct, in that nature had almost restored the mouth to regularity. The change was so marked that I felt fully repaid for carefully watching that particular case.

Now it seems to me that the young men in the profession, as has been suggested by Dr. Newkirk, should take an impression of their little patient's mouths and watch the growth and development in this direction. By so doing new ideas might be advanced which would lead us to change our past ideas. The paper alone is enough to stimulate and suggest that each individual study his cases, keep data, compare his notes, and then from time to time there will probably be a valuable accumulation of data along these lines.

Dr. W. V.-B. AMES: My recollection of what I saw of Mr. Pearsall's method is that it came nearer being a systematic one for recording, classifying, and keeping in good order specimens than any other I have seen. I was particularly impressed by the method of placing plaster casts. It is a means of throwing the surfaces, which we always care to study, into full view. I can readily see that it would be quite a task to put a lot of old models into this shape, but in making a new model there would be no extra work to shape it in this way. The peculiar hinges and some of the novelties spoken of I do not recall to mind. I know that Mr. Pearsall has been very thorough in pursuing this line of work. Personally I should expect more value from a collection of plaster models of such cases as Dr. Crouse speaks of, namely, in young children, and a collection of typical, perfect dentures illustrating temperaments. I started to make such a collection at one time when I did more prosthetic work than I do now, and it was of considerable value to me to get models of perfect dentures of the various types. Very often it will flatter patients if you ask for an impression of their jaws, and most of them will take an interest and readily consent to have it done. While I have not recently made much use of the models that I have, they were for a time of

great use to me, in that they illustrated perfect dentures of various types, and the typical slight imperfections which it is well, very often, to work into artificial dentures.

Dr. WASSALL (closing the discussion): I am very much obliged to the members for what they have said in the discussion of Mr. Pearsall's paper, because I think it is only an act of courtesy on our part to receive a paper written by a man who lives so far away from us, and who is not a member of the society. I attended the Dublin meeting of the British Dental Association in 1888, and as Mr. Pearsall says in his paper, the most important feature of that meeting was the museum. A great deal of time was spent in the preparation of it; a great deal of space was devoted to it, and it was very complete. Mr. Pearsall himself did much of the hard work in connection with this exhibit. All of the members of the different branches of the British Dental Association were not only asked, but urged to send abnormal or interesting specimens or casts in the realm of dental surgery. This was done in 1888, and it was merely to bring the matter before the profession of America that the paper was presented to-night. I regard this as the best way of exhibiting specimens and displaying them to advantage that I have seen.

Dr. I. A. Freeman read a paper entitled "The Removal of Deposits on Teeth."

The discussion was opened by Dr. F. R. Ross, who said: I hardly know how to open the discussion upon this paper. The essayist has gone over the subject in such a thorough manner that it leaves very little to be said. The only thing that occurred to me in reading the paper yesterday was that it might be well to suggest to dentists that they must remember in doing this work they are working on human tissue, and that it is apt to be very painful to the patient. I can testify to this for the reason that I have gone through the ordeal a number of times myself. During the meeting of the Iowa State Dental Society, in 1886, Dr. Atkinson worked on my mouth for two hours, and a little later for another hour. There were a great many dentists in attendance at the meeting, and a considerable number of them examined my mouth to see the work that had been done, and it was surprising to notice the difference of touch in these examinations. Some of the dentists handled my mouth as though it was made of leather, India rubber, or something of that kind, with no sense of feeling,

while others would make a careful examination with the slightest manipulation. I remember in particular the late Dr. Kulp when he came to examine my mouth and the manner in which he took hold of my lips, and carefully examined the condition of my mouth. It was a relief to me after being pulled around for two or three hours by others.

The minutiae of the work depends largely upon each individual operator's skill and the care and painstaking effort that he may give to the case. He should not attempt to do the work hurriedly. Where we find these serumal deposits in extensive layers under the gum, any one who has had any experience whatever with this class of cases knows that it is simply impossible to remove the deposits at one sitting. At least, I have found it so, and I have no doubt that others have found the same necessity for repeated sittings, and the suggestion of the essayist, that we limit ourselves to one, two or more teeth at each sitting, seems to be the right way to proceed. Having had this work done myself, it is all I would care to go through. I would not want to sit another three hours again.

When I first read the paper it impressed me that it would be a splendid essay to give to a class of dental students, but that possibly it was hardly the thing to read such a paper before this society; but when we come to reflect that probably more teeth in healthy people are lost from this one cause than from the various forms of caries, I presume it is well to call the attention of the society to the importance of this work, and I know the subject will be discussed by those much more competent than myself.

Dr. G. V. BLACK: I hardly know whether to undertake to discuss this paper or not. The matter is of such importance that we can say very little about it in a short time. I regard it as one of the most important subjects in dentistry. It has been said that more teeth are lost nowadays from this disease than from caries, a proposition with which I most heartily agree. I see more loss of teeth, more wrecking of dentures from diseases of the peridental membrane, beginning at the gingival margin, than I do from caries in my private practice. People come to us continually with their peridental membranes badly and permanently injured by these deposits. What shall we do to them? Remove the deposits, is the first thing. How shall we do it? The instruments for doing it have been described; we are coming to know the newer forms of instruments for this work, and if any of you do not know them,

well, you want to practice manipulating them until you do, and know how to place them against the roots of teeth to remove scales. This is important, and it is not a matter that is easily learned; it is not a matter that is perfectly learned; it is not a trivial matter, I can assure you. I speak thus because of the feeling I have, that the importance of scaling in this work is not yet appreciated by the dental profession. The importance of a study of the instruments and their capabilities is not yet appreciated by the profession; neither do I think the importance of the work of treatment is appreciated. Cases come to us in which the periodontal membrane is badly injured. A little effort is made to remove the deposits; a little scraping is done about recent deposits, and patients are discharged as the best that could be done. In my experience, this is much too often the case; I have patients who come to me with half of the periodontal membrane destroyed, half of the length of the root. They have used these teeth successfully in chewing for ten or fifteen years. Are they cured? No. But the scale is kept off, but the remaining periodontal membrane is injured; the teeth are good enough to do excellent work at the table, and they are not growing worse. The periodontal membrane is not replaced, but the case is kept in a condition of usefulness and free from pain. These patients are educated to come to me frequently—once in two, three, four or six months. Very few come as infrequently as once in six months; they must come oftener, and you must inculcate the idea into these patients that it is a lifetime task to preserve those teeth. I inculcate that principle in patients whose periodontal membranes have been badly injured. They keep up the use of the teeth, and in this way they have a fair degree of comfort; they chew their food well, and are also educated in the matter of chewing.

Dr. GARRETT NEWKIRK: I feel as though the remarks of Dr. Black alone are worth coming for to-night, because out of his rich experience and his being sensible of the great importance of this subject he has given us, in addition to the practical advice in the paper, a key to the situation, and has impressed upon our minds the importance of this matter in such a way that we will all be better for it in our practice. I simply want to emphasize one point mentioned in the paper, namely, the sterilization of instruments. In these days of antisepsis, when we are all impressed with the great importance of having our instruments sterilized, it is particu-

larly applicable to those which we use in the removal of deposits upon teeth, because it is with those that we are most liable perhaps to infect the soft tissues. Of course, an instrument, the use of which is confined to the dentine of a tooth, unless it happens to slip and pass the soft tissues, even if it were infected, would not do perhaps any damage; but scalers, especially those which have crooks on the ends, are difficult to keep clean, and I know of no better means of sterilizing them than by boiling them. They should be sterilized after being used and left in contact with some preparation, such as cassia, when put away, so that in the meantime they are kept constantly in the presence of sterilization.

I wish to mention one case I had a short time ago. A patient came to me with the lower incisors badly loosened by deposits and pyorrhœa, being exceedingly irregular and crowded. One of them seemed to be in a nearly hopeless condition. By simply removing the worst incisor and treating the case by usual medication and drawing the others together with ligatures the case was practically cured inside of two months. There is a healthy condition all around the teeth, they have tightened up and present a much better appearance than they did when all four of them were in irregular position.

Dr. GEORGE T. CARPENTER: There is one point that was brought out in the paper with which I agree, namely, the necessity of working on a single tooth. There is not one of us who would undertake to prepare several cavities partially and then go on miscellaneously and fill them so as to get through with the mouth. In removing these desposits I think we should take a single tooth at a time, use the necessary probes or exploring points, and diagnose the case thoroughly so as to know exactly what is going to be required in the particular case; then select the instruments to be used, and cocainize the gum, which I prefer doing with a 10 per cent aqueous solution of cocaine, which I apply directly to the bottom of the pocket. I do not use a syringe, as the solution escapes on each side of the round syringe point when applied in the pocket. My method of applying cocaine is to first dry the pocket with bibulous paper. I then saturate a few fibers of cotton, and with a thin, smooth instrument I press the cotton containing the 10 per cent solution to the bottom of the pocket and let it remain while I remove the deposit between that point and the gum margin. After ten or fifteen minutes any portion of the pocket can be

worked upon or diseased edges of the process can be removed without pain. I also like to cover the surrounding gum with cosmolin, first drying the parts. In this way we prevent a disagreeable numbness of the tongue and other portions.

Having selected my instruments for the case in hand, I use them as thoroughly as I would in preparing any cavity, and I do not leave a tooth until I consider it perfectly clean. I am then ready to give subsequent treatment, and go on to another tooth, repeating the same operation. That is one of the essential points in connection with the removal of these deposits, and that is the reason I emphasize it. I have been treating for several years the class of cases under discussion, and I have never been so satisfied with the results as I am at present. We say that results are what talk, and I certainly have had very satisfactory results since I have adopted this method.

Dr. E. MAWHINNEY: I have not used cocaine to the extent recommended by Dr. Freeman or Dr. Carpenter so as to go very far at one sitting. Dr. Freeman spoke of Dr. Harlan using trichloroacetic acid. I have been using a 2 per cent solution of it in connection with the removal of these deposits for about two years, and I use it before beginning to remove the deposits. By its use I get two results. First, an astringent effect which prevents very much hæmorrhage, and, second, the anæsthetic effect which we get from the use of cocaine. I take a few shreds of cotton which I put on the scaler I use for the purpose, the cotton is wrapped all around the tooth on which the deposit is, and left there for a short time. I then go to the next tooth, and so on, taking three or four teeth in hand at one sitting. In this way I find that I can remove these deposits with much less pain than by any other method I have tried. I think there is nothing that is so trying in dentistry as the removal of these deposits. Dr. Black says, remove the deposit. I also say, remove the deposit. But I declare, it seems to me, every case I get is more difficult than the last one. (Here the doctor spoke of the difficulty attending the removal of serumal calculus, illustrating his remarks by diagrammatic sketches on the board and the citation of cases.)

Dr. DON M. GALLIE: In scaling the incisor teeth we more frequently find the lower incisors injured by salivary deposits on them than on any other teeth in the mouth. I recall a case that I had about five years ago where four incisors were quite loose, so

that in removing the deposits on them there was also danger of removing the teeth. To guard against any such misfortune I took a strip of modeling compound, made a shallow impression of the top, allowing it to harden in ice water. I then trimmed the strip labio-lingually and allowed a sufficient quantity of the modeling compound to set back upon the teeth and hold them firmly after removing the tartar. The teeth were so loose that I was extremely doubtful whether they would remain in place. I then ligated the teeth, allowing the impression of modeling compound to remain on top and flowed in cement. After this I was able to thoroughly cleanse the teeth and did not have to resort to the use of modeling compound to hold them in place. I saw the patient three weeks ago and was surprised to see the teeth in such excellent condition. In this case the treatment was a complete success, although at the time I thought I had to deal with a hopeless case on account of the teeth being so loose. I believe that had I resorted to the ordinary method of removing the calcareous deposit I would have injured the teeth to such an extent that they would have been lost.

I wish to emphasize what the essayist has said with reference to lightness of touch and in using instruments that will pass along the sides of the roots and remove serumal calculus. The sensation imparted to the fingers cannot be transmitted to the operator if he uses too much weight in his manipulations. The instrument should be held lightly between the thumb and first two fingers and passed down in such a manner so that the slightest obstacle encountered may be communicated to the fingers.

Dr. J. H. WOOLLEY: Some time since I had the pleasure of witnessing Dr. Younger's method of operating in removing tartar from the teeth, and I watched him at his clinic for about an hour, and from time to time the patient was asked whether she was suffering any pain, and she said no. The reason of it was that all of the instruments I saw him use were made by himself. In operating he did not permit his instruments to interfere very much with the gum in pushing it aside. The edges were so small and Dr. Younger's sense of touch so delicate that he could feel the least obstruction of the tartar, and for that reason he was enabled to remove it very thoroughly without appreciable pain. It requires the same necessary instruments to remove the tartar as it does to remove the decay from the teeth. These instruments should be of

various sizes and kinds. With reference to keeping the parts dry with spunk or bibulous paper, or whatever may be used, I think in that direction we could use warm compressed air to advantage. Any one who has not tried it cannot understand how beneficial it is in perfectly drying the teeth. You discover the least amount of deposit. Then again, there is a great deal in the education of the fingers of the hand. I find a very marked difference in the use of instruments in the removal of tartar by carving. I have carved a little in cameo, and there is that delicacy of touch required in the carving of cameo or figures that you feel from constant practice the least sensation produced. You have to be very careful not to destroy your figure. Manual dexterity in this work comes from careful training of the fingers in a special direction.

I agree fully with those who have spoken with reference to the necessity of the preservation of teeth in this direction because I believe there are more teeth lost by these deposits than from any other cause.

The old-fashioned instruments of which Dr. Freeman has spoken and have been passed around have suggested the idea that the dentists in those days must have been giants and that people must have had very large teeth in order to require such large scalars.

Dr. C. P. PRUYN: I was greatly pleased with the remarks of the essayist recommending thoroughness, but it is impossible for us to do much in the line of thoroughness without thorough coöperation of the patient to begin with. To do that there must be some education. The average patient who presents himself with a case of salivary or serumal calculus is not fully aware of the condition that exists, and it is difficult sometimes to impress upon his mind the gravity of the situation. Until we impress upon such a patient's mind the gravity of deciduation and have his coöperation and point out the dangers that come from the accumulation of these deposits upon the teeth, we are not going to accomplish satisfactory results. But by thoroughly drilling them upon this subject, giving them to understand what the results will be if the deposits are not removed, we can proceed with our work with some degree of success. I inform my patients that the operation of removing these deposits is something more than cleaning the teeth; that it is a surgical operation; and if you suggest to a patient that it will cost several dollars in order to remove these deposits with

care and thoroughness, he is really astounded, he is very apt to think that you are a robber, so that we have many things against us when we attempt to perform an operation in a thorough and conscientious manner. But I know of nothing in our practice that will yield better returns to us than a thorough understanding of this disease and the methods of combating it.

It has been my fortune, or perhaps misfortune, to have had quite a large practice in this particular line of work, and while I have had some very difficult and trying cases to deal with, the results have been fairly satisfactory. I believe that we have made considerable progress along this line, and as we go back ten years and compare the attitude of the profession of that time with it to-day we notice a marked advance. How to handle some of these cases and remove the deposits from teeth is a very difficult thing, and it requires the most careful, painstaking efforts on our part, with the coöperation of the patient.

The essayist spoke about using a 2 or 4 per cent aqueous solution of cocaine, locally applied. I think a stronger solution can be used with perfect safety and with more satisfactory results. I think such a small per cent of cocaine would be taken up by the absorbents. A 2 to 4 per cent solution injected hypodermically would perhaps be sufficient in some cases, but it seems to me for a local application something stronger than this is much more satisfactory.

Dr. I. A. FREEMAN: I am very much pleased with the course the discussion has taken, as I felt very solicitous about it. I made up my mind that we would hear a good deal about pyorrhœa alveolaris as soon as reference was made to it. As an excuse for writing such a paper I want to say that, when I first commenced to write I did not know how to treat it. The subject was suggested to me by Dr. Harlan, and I am sorry that he is not here to participate in the discussion.

Dr. Black spoke of seeing patients frequently subsequent to the removal of the deposits. I have two patients in mind at the present time who have come to me to be relieved of subsequent deposits upon the teeth after thorough removal. It seems necessary to go over the teeth very soon and frequently after the first operation. What is to be done with such cases? A lady came to my office yesterday whom I have not seen for about two months. She was suffering considerable pain. The pyorrhœa pockets that

had been severe six months previously and the deposits removed had healed, and I had no fault to find with them. This time the trouble was in a new direction. The teeth that I had thoroughly cleared of all deposits and had taken a great deal of pains with are now loaded again. I have another patient, a gentleman, who comes to me every now and then. He rarely goes five or six weeks without coming to see me, having more or less deposit removed from the teeth each time, and I assure you that if he did not do this he would be in trouble. The deposit is of a light color, coarse grained, and very irritating.

I want to emphasize the point made by Dr. Black. I believe that antisepsis in surgery and elimination in therapeutics, as suggested by Dr. Newkirk, are the keynotes in these two departments of work, as well as the sterilization of instruments.

Dr. Carpenter says that he uses a 10 per cent solution of cocaine. Personally I do not like to use so strong a solution. We do not know the idiosyncrasies of a patient until we have used it, and I am inclined to think we never know these idiosyncrasies with reference to cocaine, that is why I prefer a mild solution, because in my use of it I find it is sufficient, and while I used to use a 10 per cent solution I rarely ever do it now.

As to the use of trichloracetic acid, mentioned by Dr. MaWhinney, I really have not had sufficient experience with it to give an opinion. But I know dentists who have used it in conjunction with alumnol speak of it very highly. You will remember that I emphasized the difficulty in my paper of removing these deposits. It is certainly one of the most difficult, wearisome operations that I have ever had anything to do with, yet we need to be persistent and untiring in our efforts to obtain satisfactory results. How many of us can sympathize with Dr. Gallie in his effort to save the loose teeth of which he has spoken in one case and to clear them of the foreign substance upon them. I have a patient in hand now where the superior bicuspid is very loose, and in order to clear one recently I had to ligate it before I could really do anything. I am surprised to-day to see how that tooth has become fast, although there has been great recession and waste of the gum, at the same time the tooth is nearly a hundred per cent better as a consequence.

Dr. Woolley seems to have found out the secret of removing these deposits without pain. He says that Dr. Younger devises

and prepares his own instruments for this purpose. I think the instruments we have here to-night are as delicately formed and as well prepared to meet the case as any instrument that can be made. Who ever saw more beautiful instruments than these? They have been made under the guidance of a practical man, a man of wide experience, who knows the needs of the profession.

I was glad to hear Dr. Pruyn talk along the line of thoroughness. Not long since I was in his office when he exhibited a patient to me for whom he had removed a deposit that had existed for some time. There was considerable recession of the gum. The teeth were long, and the gum settled below where it should be. The teeth that he cleaned were as white as one could well wish. Since then I have had several object lessons from other practitioners. I hope Dr. Pruyn will go on exhibiting these cases, because they prompt us to do better and more thorough work. I had a similar case since I saw Dr. Pruyn's, and I went to work and thought I had thoroughly cleaned the teeth. I applied the rubber dam on the front lower teeth and dried them off, and I was surprised at the amount of concretion that still remained on these teeth. There was enough present to have carried on the disease rapidly. If the deposit is not thoroughly removed, we can readily see how easy it is for further concretion to take place.

Dr. C. F. HARTT : In regard to the use of carbonized water, I always supposed that the carbon dioxide in the breath precipitated the lime salts and caused deposits upon the teeth; consequently I do not see how carbonized waters will help to remove these deposits. I may be wrong about this.

Dr. FREEMAN : Carbonic acid is detected by lime solution. For instance, we have a solution of lime and we suspect carbonic acid, we place an open vessel containing limewater where we suspect the poison if it becomes milky, or turbid, indicates the presence of carbonic acid, but the carbonic acid at the same time, is a great solvent of lime. It precipitates the lime which is held in solution.

Dr. HARTT : What does?

Dr. FREEMAN : The carbon dioxid.

Dr. HARTT : The lime that is held in solution in the saliva, is thrown down by the carbon dioxid in the breath and passes over the teeth.

Dr. FREEMAN : That is so. Water in itself is a solvent of all

things, as Professor Haines says. All substances are soluble in water to some extent. If you add carbonic acid to water it renders it a very much more soluble agent. For instance, he speaks of it in this way : Water that is conducted through subterranean channels, passing over lime rock or lime soil, passing in the under strata, becoming charged with carbonic acid, because carbonic gas is heavier than the atmosphere and settles to lower levels, the water becomes saturated with it, giving greater solvent properties to the water which takes up the lime from the soil or rock over which it passes it renders the water very hard. The carbonic acid charged in the waters provided for soda fountains is powerful enough to soften and wash away the lime that is found upon the teeth. If held in position the breath may act on it in a measure and throw down what is in it to some extent.

Dr. A. H. PECK : I wish to say with reference to this question of chemistry, that the lime salts are not held in solution in the saliva. It is improper to put it that way. Carbonic acid gas is one of the constituent elements of the saliva as the latter flows into the mouth from the glands, and the lime salts which are freely soluble in the gas are, by it, held in suspension in the saliva. Ammonia gas has a great affinity for carbonic acid gas, and it is the ammonia gas, generated in the mouth, uniting with the carbonic acid gas which sets the lime salts free to be precipitated upon the teeth.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

The regular meeting was held March 8, 1897, at 1414 Reliance Building, with President George B. Perry in the Chair.

The Chair announced that discussion was now in order on question 6, submitted by the American Dental Association, which is as follows : "In View of Recent Investigations has Amalgam been a Blessing or Curse to Humanity?"

DISCUSSION.

Dr. BLACK : I hardly know how to enter on the discussion of this proposition as stated. Of course, the recent investigation has nothing to do with the question; it has only opened up further knowledge of the subject. There is this that has become very clear, we have never been able to control results in our use of

amalgam, and we begin to know the reasons why we have been unable to do so.

It is certainly a fact that a considerable number of amalgam fillings have done good service. It is also a fact that a very large proportion of amalgam fillings have not been a success. I think we have come to look upon amalgam as a very uncertain filling material. We now know that it is a fact that the same amalgam does not produce the same results at different times, the same preparation may come to us good or bad; it may come to us good, may become bad on our hands; may be good to-day and bad to-morrow, and we understand that we never could, as we have been using it, be at all certain as to the usefulness of amalgam. Now whether it has done more harm than good would seem to be the question. It seems to me a retrospective question that is difficult to discuss. It would require that we examine records and learn of results to answer this question as to whether or not it has been a curse. My feeling has been rather that it has been something of a curse, while at the same time individual cases have been benefited by the use of amalgam. I do not think we can get along without it; we can at least render a tooth useful for a little while that we would not like to undertake to fill with gold.

The difficulty with amalgam has been the immense number of teeth that have been filled with it with a view to their preservation and failed, and especially for young people. I see so many cases where the teeth of children—persons in their teens, have been filled with amalgam and in a little while go to pieces. They fail, and are not attended to early enough, and the teeth are literally destroyed from neglect, if I may so term it, or the dependence that is placed in the amalgam fillings. The black ditch that comes around the filling in such a large proportion of the cases extends so far that the pulp of the tooth is often endangered, or so diseased that it cannot be restored, and the loss of the pulp of the tooth in these young people is always serious. It seems to have been thought that that black ditch was caused by the chipping of the margins of the amalgam, but it is not. It is the disintegration of the walls of the cavity that produces the black ditch; it is the tooth structure itself. It is loss of tooth structure in every instance.

THE CHAIR: The amalgam does not shrink?

Dr. BLACK: The amalgam shrinks enough to admit microö-

ganisms. You cannot see it with the naked eye ; you cannot see this shrinkage in the filling, you cannot see the line of shrinkage, but it admits microorganisms ; often they can go in 100 abreast where you cannot see the opening, and then the work of destruction begins ; begins immediately in a large number of cases, and goes on, effecting the loss of tooth structure in every instance where that black ditch is formed. It is not a chipping of the margins of the amalgam filling. The chippings of the amalgam filling I think a very rare thing indeed, and never occurs except in the chipping off of overlaps where the filling has been overfull.

It is difficult to discuss this subject from the standpoint given. I must say that I do not like the statement of the question. Of course Dr. Pruyn would take an entirely different view, and many others in the profession I think would be dissatisfied with that statement of the question. It simply refers to a question of fact in the past about which we can only form opinions.

It does seem to me that if we could not improve amalgam, we would, with what is now known about it, feel like throwing it aside entirely ; yet the prospect is that within a reasonable time we will have far more confidence in it than we have ever had, and that it will really become a thing of value to us.

I would say this : Since I have been in Chicago this winter certain parties have used my apparatus to see if they could produce my results ; they are doing so quite readily, and are making fillings that remain perfect, so that neither the microscope nor micrometer show any change in the material whatever after the filling is made. They also have made experimental work to produce the changes in bulk in the formula with which I have had large changes, and they produced those changes in bulk also without difficulty. I find they are able to produce an amalgam that will expand widely, shrink widely, or remain stationary, much as they please. Now if others can at once copy my results in this respect, I see no reason why manufacturers should not give us an amalgam so conditioned that we can generally accomplish good results.

THE CHAIR : Will you permit me to ask you another question, which in reality belongs to this sixth question, and is practically a part of it, question seven : " Are there any Proofs that the Mercury in Amalgam Fillings is injurious to the Health of the patient ? "

Dr. BLACK : I should say, no, having never known a case

where the disorder could be traced to the mercury in the amalgam filling. I know there has been quite a controversy on that point, and it has caused me to look after it pretty closely, but I cannot find that that is the case. Now some persons are very susceptible to the action of mercury; a very small amount of mercury will produce salivation. I think of one case now which a physician related to me only a short time before I left home. A patient was given 2 grains of calomel, and was salivated badly. It came into my head to inquire into the state of the teeth, and I found as a matter of fact that there were five or six amalgam fillings, very good, large ones, and the patient was not salivated by them, when they were put in, or afterward, only when she had taken some salt of mercury. No, I do not think there is anything in that question.

THE CHAIR: I think these high potential people would probably say that the five or six amalgam fillings in her mouth communicated that increased susceptibility, so that when the 2 grains were given her, it caused the result.

Dr. BLACK: It might be. Mercury in that condition is not high potency material; they are on the wrong side of the fence from their own statement of science.

Dr. A. C. HEWETT: The hands of the clock admonish me that I would make a very grave mistake if I were to attempt to enter upon a full discussion of a question of this importance to-night. I can simply give you an opinion which I have formed by some study and much experimentation, but it would be an opinion. I have not at hand to-night data of recorded, painstaking cases that would give any weight to my opinion.

To answer the question in the affirmative, that it had been a curse, would be to charge the whole dental profession with working a curse, for I do not believe you can find an office in the United States that does not have its amalgam. I do not believe that you can find an operator in the United States that does not at times put in amalgam fillings. To me it is as plain as sunlight, that if such a use of any material were a curse it would have been driven from our midst, especially when we think of the scientific achievements in the dental profession, of the study that has been given to that field, there is only one answer to that question.

The second question, whether there is any injury from mercury upon the system—my experience and observation is, that occasionally we get pytalism from the mercury in the teeth, the mercury

being changed to calomel or to bichloride of mercury by the action of the fluids of the mouth and stomach, and hence ptyalism, but it is of such rare occurrence that it is not worth any thought or study or any care. Not one in one hundred thousand, I believe, has ever had any trouble from the deterioration of the mercury or the change, chemically produced which must be if ptyalism or salivation, as we call it, comes on from the effect of the mercury in the amalgam.

There was one remark dropped by Dr. Black which I must take issue with—that the “black ditches” come from a loss of tooth substance. I cannot see it in that light at all. From a series of experiments that I made, covering a course of some five years over twenty years ago with regard to that very point, I found that the black ditch extended around the tooth as markedly where there was a bold, strong, thick portion of the enamel as where it was thin, and the enamel was broken away. My theory of the black ditch around the amalgam is entirely different from that of Dr. Black, and I am so sure of my own position that I think I could demonstrate it to any of these men. It arises from this in my opinion, that when the alloy is mixed with mercury and pressed into the tooth the free mercury tends to the outer wall; that is a matter of common observation; everybody knows that. Now as the plug is built up from the bottom, the mercury is pressed out and comes to the surface and the side walls. You have consequently, when the plug is finished, a ring about that plug next to the tooth that is not, say, one-half as dense as it is in the middle or at the bottom. What is the consequence? This thin, supersaturated mass that is on the outer rim evaporates and wears away long before the tooth has had time to decay. In some instances it will do it in a week. I have seen it in that course of experiments where that ditch, before it had time to blacken, even, would be so marked that you could take a fine point and trace it between the enamel and the filling, and hence arises that black ditch in my opinion—really a want of proper manipulation on the part of the operator. I give that as an opinion. I hope and I believe that there is enough wit, that there is enough scientific attainment, that there is enough courage and that there is enough industry in the profession of dentistry to find a mixture of metals that will not shrink, that will have sufficient strength to support its edges, that will not exhibit those black ditches and will be an untold benefit and honor to the profession, and I am in hearty accord with the remark that Dr. Black made,

that we should sometime find a preparation, if we have not already, that will fulfill our hopes in this matter.

Now I ask you, gentlemen, in the mouths that you examine that come to you from day to day, if there are not as many gold fillings that have proved partial or complete failures as there are amalgams. Take them as they come, and your preparations as they come, from no matter what operators, no matter what state, no matter what city, compare filling by filling, will you not find as many failures in gold plugs, in proportion to the number that there are, as you will amalgams? And yet nobody thinks that gold is a failure, or that gold is a curse.

Adjourned.

TO ABORT CORYZA.

Ten grains each of Dover's powder and phenacetin are put into four capsules; two of these are given at once, and the patient remains for about ten minutes in a hot bath. He then takes a hot lemonade or rum punch and gets between several thicknesses of heated blankets. In half an hour the second two capsules are given, unless perspiration is already abundant. Such perspiration should continue for an hour, after which the skin is slowly dried, and the patient retires for the night to a comfortable bed.—H. B. WHITNEY.

INFECTIOUS NATURE OF ACUTE RHEUMATISM.

The infectious nature of rheumatism is shown, according to Jaccoud, by the case of an infant born while the mother was suffering from rheumatism. Twelve hours after birth the child was attacked by a fever and swelling of the joints. These signs disappeared under salicylate of sodium at the end of eight days. In a second case the mother was delivered on the fifth day of her polyarticular rheumatism. Three days later the infant became affected.—*Journ. de Méd. et de Chir. Prat.*, February 10.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

STATE MEETINGS.

Before this journal reaches the reader, many of the Western and Eastern States will have held their annual meeting. The programs are full of promise of good results and all of the live topics are sure to be thoroughly discussed. No period in the history of professional advance is fuller of pregnant subjects than the present. The work of Williams so recently published will receive merited discussion and the old, old question of filling materials will receive its due share of attention.

Cataphoresis, the livest topic from the operative standpoint, will have new light thrown upon it, as the army of experimenters is rapidly growing larger and more enthusiastic. To the stay at home we urge careful reading of all that is new and beg to assure him that contact and friction with his fellow practitioners is what is most needed by him. Will you not take a leap into the arena and give up some of your acquired knowledge?

THE OUTLOOK.

In this year of 1897 all of the schools of dental surgery are increasing their facilities for teaching, not only in the practical departments, but also in the more strictly scientific branches.

From what we can learn, there is a growing feeling that the terms of pupilage will shortly be increased so that few schools will hold sessions of less than nine months in each and every calendar year. Contrasting the existing conditions with those of

ten years ago, it may be seen that a great and rapid advance has taken place. At that period several of the best known and longest established schools gave only two terms of four and one-half to five months' duration, and all of them now hold sessions of not less than six months, covering three years instead of two. The outlook is most promising, and the next advance will be to move up to the nine months' session. Already Boston, Harvard, California, Michigan, Minnesota, Iowa and a few others are in line. Pennsylvania, we believe, has already seven or eight months, Cleveland and Detroit are close behind, and Chicago will have to follow suit. If the schools adopt not less than a high school certificate as a minimum for entrance, we will then be in a condition to equal in our literary advances, as we now equal the professional teaching in foreign countries. The schools will follow the demand of the profession as soon as the components are ready for the advance.

CATAPHORESIS.

For the past three years cataphoresis has occupied a prominent position before the dental profession, and the periodical literature has been teeming with articles upon the subject. It may be considered as having passed beyond the experimental stage and the question now regards merely its value in dental practice. The fact that the application of electricity in this form is accompanied by more or less danger, should not be considered a factor against its general use, if satisfactory results can be attained. Anæsthetics and certain drugs, such as arsenious acid, are all more or less dangerous, and it is only in the intelligence of the practitioner that trust must be reposed.

The principal value of cataphoresis is in allaying sensibility of dentine, preparatory to excavation, while occasionally a pulp may be removed at the time of opening into a pulp chamber, as a rule, with the means now at our command, cataphoresis need only be resorted to, as a matter of convenience and not as an agent which will accomplish what cannot be accomplished as well by other means. Some additional information is wanting, and probably some further perfection of appliances is necessary before reasonable safety is assured, when it is desired to pass the current and drug directly into the soft tissues.

Hence, as previously stated, the principal value of cataphoresis lies in its use in sensitive dentine. According to our view it is still a question to what extent, suggestion, if you please, rest and confidence and the quieting effect of the same, contribute to the electric force and the drug in securing a measure of insensibility.

In some cases the mere application of any drug, provided the patient feels satisfied as regards its potency, is effectual, while in others the cataphoric current, for twenty or thirty minutes with the purest drug, is ineffectual. However, as a rule, the rest given to the patient, the time for contemplation, (especially if the instruments are out of sight, the chair being so turned as to give a pleasant view of pictures, scene from the window, etc.,) seems of considerable value.

It may therefore be summed up in this manner : Cataphoresis in some cases has undoubted value as an agent for allaying sensitive dentine, but that it is not possible at this time to determine, nor is it material for that matter, whether the drug or its accessories, electricity and rest, contributes in the largest measure to attain the result. We recommend that those who use cataphoresis, closely watch the effect and carefully note the results, so that in course of time the principal agent may be most prominently employed.

REVIEWS AND ABSTRACTS.

A PRACTICAL TREATISE ON ARTIFICIAL CROWN AND BRIDGE WORK.
By GEORGE EVANS. (Fifth Edition Revised.) S. S. White Dental Manufacturing Company, Publishers. Price, \$3.00

It is very rare for any book to reach so many editions in so short a time. The present volume is the fifth edition revised. It may be accounted for on the ground of there being a great demand for a work on crown and bridge work, as so many in the profession were without any knowledge of the methods of construction.

The utility and necessity of crowns and bridges has developed rapidly. As the author says, the practice has been in an experimental stage during the time which called for frequent revisions of the work.

The present volume is one that is much superior to its predecessors. The best has been retained and many new suggestions

presented. In its present form every variety of crown or bridge that is at all practical, is most carefully and clearly described. Thus the many ways mentioned of constructing these appliances makes the book of inestimable value to the practitioner, the student and the teacher. It should be in the hands of all. The illustrations are very fine and so well executed that it would seem that one might succeed in making any of the crowns and bridges described without other assistance. No one anxious to excel should be without it.

A. O. HUNT.

AN ACT TO REPEAL ARTICLE 3 OF CHAPTER 110 OF THE REVISED STATUTES OF MISSOURI OF 1889, AND TO ENACT A NEW ARTICLE IN LIEU THEREOF, TO BE KNOWN AS ARTICLE 3 OF CHAPTER 110.

[This act passed both houses of the Assembly, and is now the law of Missouri.]

Be it enacted by the General Assembly of the State of Missouri as follows:

SECTION 1. Article 3 of Chapter 110 of the Revised Statutes of 1889 is hereby repealed, and the following article is hereby enacted, to be known as Article 3 of Chapter 110.

SEC. 2. It shall be unlawful for any person not a registered dentist within the meaning of this act to practice dentistry or dental surgery in any of its departments, as principal or agent, in the State of Missouri, except as hereinafter provided.

SEC. 3. The Governor shall appoint five persons from among the reputable dentists of the State, all of whom shall have been residents of the State for at least five years, and of at least five years' experience in their profession, who shall be known and styled "State Board of Dental Examiners for the State of Missouri," one of whom shall hold his office for one year, one for two years, one for three years, one for four years and one for five years, and each until his successor shall be appointed and qualified. Each year thereafter one member or more, as may be required, shall be appointed for a term of five years, or until his successor be appointed and qualified, and if any vacancy occur in said board, another shall be appointed as aforesaid to fill the unexpired term thereof. Said board shall have full powers to make any by-laws and necessary regulations for the proper fulfillment of their duties under this act. It shall choose one of its

members president and one secretary, and shall hold two regular meetings each year at such dates and places as may be deemed best. Special meetings may also be held if, in the judgment of a majority of the board, the necessity shall arise. A majority of the board shall constitute a quorum for the transaction of business. Said board shall keep a full record of its proceedings, and a full register of all persons licensed and certified as dentists by said board, which shall be public records, and at all times open to inspection as such. A transcript of any of the entries in such record, certified by the secretary under the seal of said board, shall, at all times and places, be competent evidence of the facts therein stated. The members of said board shall have power to administer oaths and hear testimony in all matters relating to the duties imposed upon it by law. Said board shall make an annual report of its proceedings to the governor on or before the 31st day of December of each year.

SEC. 4. It shall be the duty of every person who is legally engaged in the practice of dentistry in this State at the time of the passage of this act, who shall have legally qualified as such practicing dentist under the laws of the State of Missouri in force at the time of the passage of this act, and desiring to continue such practice, to file with the State Board of Dental Examiners his certificate of registration as received from the clerk of the county court where he shall have registered, or if he shall have registered in the city of St. Louis, then his certificate from the city register of the city of St. Louis, within ninety days after the passage of this act, whereupon the board shall issue to such person a certificate upon the payment of a fee of \$1.00: Provided that the board may, in any case which they deem proper, require the holder of a certificate of registration to prove that he or she is the lawful possessor of the same, and that said certificate was obtained without fraud or false representation, and the lawful holder thereof shall be entitled to all of the rights and privileges herein mentioned. The certificates required to be filed with the board under this section may be presented to the board by letter or by proxy, and the board shall issue its certificate as though the person presenting the same were present.

SEC. 5. Any person desiring to practice dentistry in this State who shall have received a diploma from the faculty of some reputable dental college, duly authorized by the laws of this State

or some other of the United States, in which college or colleges there was at the time of issue of such diploma annually delivered a full course of lectures and instruction in dental surgery, said course of lectures to be not less than a period of six months each year for three separate years, shall present his diploma to said board for verification as to its genuineness. If the diploma is found to be genuine, and the person therein named be the person claiming and presenting the same, the State Board of Dental Examiners shall issue its certificate, signed by at least three of the members thereof, for which certificate the board shall receive the sum of \$2.00, to be paid by the person offering such diploma for verification, and such certificate shall be deemed conclusive as to the right of the lawful holder of the same to practice dentistry in this State. Graduates may present their diploma and affidavit as required by this section by letter or by proxy, and the board shall issue their certificates thereon as though the owner of the diploma was present. Such affidavit may be taken before any person authorized to administer oaths, and the same shall be attested under the hand and seal of such officer, if he have a seal. All licensed dentists shall, on or before the 30th day of November of each year, forward to said board his signature and address, together with a fee of \$1.00, whereupon said board shall reregister such licensed dentist in a book to be kept for that purpose, and renew the license of said dentist for one year from that date. Said board shall be authorized to ascertain or determine what shall constitute a dental institution in good standing, and may make all necessary rules and regulations for that purpose.

SEC. 6. Any and all persons who shall have actually studied dentistry in this State for three years under a legally registered dentist, or who may have a license from the dental board of another State, and who shall desire to practice dentistry in this State after the passage of this act, shall file application, in writing, with the secretary of said board of dental examiners, for examination and license, and at the time of making such application shall pay the secretary of said board a fee of \$10.00; and each applicant shall present himself before said board at its first regular meeting after his application for examination shall have been filed. The examination shall be of an elementary and practical character, but sufficiently thorough to test the fitness of the applicant to practice dentistry. The examination may be written or oral or both.

at the option of said board, and shall include the following subjects, to-wit: Anatomy, physiology, chemistry, materia medica, therapeutics, metallurgy, histology, pathology, and operative, mechanical, surgical and practical dentistry. All persons of good moral character, who shall successfully pass such examination, shall be registered and licensed by said board, and shall receive a certificate of such registration and license, duly authenticated by the signature of the president and secretary and the seal of said board; and in no case shall the examination fee be refunded. If an applicant shall fail to pass the examination, the fee for a subsequent examination shall be \$5.00.

SEC. 7. Any two members of said board may issue a temporary certificate to any applicant upon the presentation by such applicant of the evidence of necessary qualifications to practice dentistry, and such temporary certificate shall remain in force until the next regular meeting of said board occurring after the date of such temporary certificate and no longer. Two such temporary certificates cannot be issued to the same person.

SEC. 8. No person having received a certificate from the State board of dental examiners in the manner hereinbefore provided shall engage in the business of a dentist in any county of the State in which he shall locate, or into which he shall afterward remove, until he shall have had such certificate recorded in the office of the clerk of the county court in such county, and it is hereby made the duty of such county clerk to record such certificate in a book to be provided and kept for that purpose, and the clerk is authorized to charge a fee of fifty cents for recording each certificate, to be paid by the person offering such certificate for record. The record of each certificate required by this act, or a certified copy thereof, shall be evidence in all courts that the person holding it is a registered dentist within the meaning of this act. The register of the county clerk shall be open to public inspection during business hours. Any failure or neglect or refusal on the part of any person holding such certificate to register the same with the county clerk as above directed for a period of six months, shall work a forfeiture of the certificate, and no certificate when once forfeited shall be restored except upon the payment to the said State board of dental examiners the sum of \$25.00 as a penalty for such neglect, failure or refusal.

SEC. 9. All persons shall be said to be practicing dentistry,

within the meaning of this act, who shall for a fee, salary or other reward paid or to be paid, either to himself or to another person, perform dental operations of any kind, treat diseases or lesions of the human teeth or jaws, or attempt to correct malpositions thereof. But nothing contained in this act shall be taken to apply to acts of *bona fide* students of dentistry, done in the pursuit of clinical advantages while in attendance upon a regular course of study in a reputable dental college, or under the direct supervision of a preceptor, who is a licensed dentist in this State, or to legally qualified physicians in the regular discharge of their duties.

SEC. 10. Out of the funds coming into possession of said board as above specified, the members of said board may receive as compensation the sum of five dollars for each day actually engaged in the duties of their office as such examiners, and a mileage of three cents per mile for all distances necessarily traveled in going to and coming from the meeting of said board. Said expenses shall be paid from the fees and assessments received by said board under the provisions of this act, and no part of the salary or expense of said board shall ever be paid out of the State treasury. All moneys received in excess of the said per diem allowance and mileage as above provided for shall be held by the secretary of said board as a special fund for other expenses of said board, and for carrying out the provisions of this act. The secretary of said board shall, from time to time, give such bond for the faithful discharge of his duties as the custodian of the funds of said board as it may direct.

SEC. 11. Any person who shall practice or attempt to practice dentistry without a license, or without having his license renewed as provided by Section 5 of this act, shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by a fine of not less than \$50 nor more than \$200, or by confinement in the county jail not less than twenty days nor more than sixty days, or by both such fine and imprisonment. All fines thus received shall be paid one-half into the common school fund of the county in which conviction shall be had and the remainder to such board. It is hereby made the duty of the prosecuting attorney of each county in the State to prosecute every case to final judgment whenever his attention shall be called to a violation of the provisions of this act. Justices of the peace and the respect-

ive municipal courts shall have jurisdiction over violations of this act.

SEC. 12. Whenever in this act it is provided that any duty or service shall be performed by any county clerk, such duty and service in the city of St. Louis shall be performed by the city register of the city of St. Louis as if said officer was especially named to perform these duties and services, and said register shall receive the same compensation therefor as this act provides shall be paid to county clerks. Provided further, that whenever in this act the word "county" is used, it shall include the city of St. Louis the same as if said city were specially named.

SEC. 12 *a*. That no professor, director, owner or stockholder of any dental college or school shall be appointed or be a member of said board.

SEC. 13. All acts and parts of acts inconsistent with this act are hereby repealed.

DENTAL COLLEGE COMMENCEMENTS.

Fifteenth annual commencement of the Kansas City Dental College, Wednesday evening, March 31.

GRADUATES—Arnelle Delbert Andrews, Claude Backus, Guy Collins Colman, William Emery Cutler, Wesley Roberts Crawford, Charles William Chalfant, Freeman Davis, James Pleasant Dawson, Howard Stanton Engle, Harry William Fessenden, Roger C. Fields, James Hamilton Graham, Mark Dryden Gwinn, Clinton Thomas Hart, Charles LaFayette Hopkins, A. Porter Hults, Shelley Keats Johnson, James Thomas Keith, George Henry Kittell, Leonard D. Koger, Thaddeus S. Kelly, Curtis Lee Larmer, Frank Edward Leviston, Cullen Bryant McCarty, William Asa Moore, William H. Nipps, John William Nether-ton, Simon Guy Numbers, Robert Henry Pendleton, Thomas Edward Purcell, Clyde M. Pancoast, John Armstrong Reily, Elby Drue Rogers, George Ruddell, Jr., Edward Holcomb Stiles, Jr., William Samuel Thomas Smith, George Clark Seyster, John Thomas Wilson, Elijah Gwinn Winkler.

Fifty-first annual commencement of the Ohio College of Dental Surgery, Department of Dentistry, University of Cincinnati, Tuesday, April 6, 1897.

Matriculates, 212. Graduates, 50.

GRADUATES—Edward Arthur Baldwin, Elmore Franklin Barrington, Charles Chase Boggess, John Andrew Bouvy, Harry Clay Bowen, Harry B. Buchanan, Norwood DeVacht Chamberlin, Philip Sheridan Chesnut, Hugh Robert Conklin, Burdette Lee Conway, Frank Austin Dille, Clinton Howard Doss, Ralph William Ernest, Clifford Thomas Eskey, William Thomas Embree, George Fischer, Homer Curtis Foster, John Jay Foster, Mrs. Nellie E. Freeman, Edgar E. Heizer, Emil Louis Haring, Thomas Alonzo Hyer, John Frank Herdliska, Warren B.

Harris, Lewis Thatcher Ivins, Claude Everett Keeney, Jottie Hopper Kendall, William O. Kuechler, John Henry Marvin, Alviere Milligan, James Maxwell Monfort, Orlando Clinton Moon, Miss Ella E. McKallip, Milton Grant Phillips, James Thomas Ralston, Forster Robinson, Will Eckman Robinson, Shotwell H. Roff, Albert Richardson Riggs, August Schwartz, Joseph C. Sheets, Albert Howard Sherick, Harry Armstrong Smith, David Stern, Herbert Hoffman Truesdell, John Wallace Taylor, Duncan Pendelton Turner, Frank Reynolds VanMeter, Frank Moulton Warwick, Benjamin James Wolf.

The Northwestern University Dental School; Dental Department of Northwestern University, held its eleventh annual commencement Friday, April 2. The following received diplomas:

GRADUATES.—Algeron Alfonso Atwood, George Elmer Ames, Frank T. Armstrong, William Orwin Allen, Edward Francis Burns, James Vining Brown, William Henry Harrison Barker, Frank Allen Bryant, Rudolph Heinrich Bloese, William Beidler, Lewis Taber Bristol, Ira Clifton Brownlie, Harold Ingram Bragg, Alvin William Barthel, George Isaac Bevier, Albert Earnest Brandes, Walter Cone Beesley, Newton E. Ballou, Macia Arlowine Berlyn, Bert Hamilton Biglow, Charles James Breckenridge, David Shaffer Brogunier, Nathan Lewis Burke, Rudolph Bostelman, Herbert Elliot Burnett, Jacob J. Bing, Frederick Joseph Brown, Nellie Babcock, James Leonard Babcock, Leopold Bertrand, Charles Walker Chubbuck, Clarence Eugene Coy, Walter Henry Caradine, Samuel Hamilton Chase, Winfield Scott Clark, Roy Arthur Case, Emerson E. Cherrington, Felix Bucknam Cassidy, Lewis Edwin Crandall, John Darwin Davis, John Thomas Dixon, Alexander Clifford Dawson, Edward Henry Drews, Wilbur M. Dace, Albert George Doepp, Albert James De Velde, Samuel Leonard Drake, James William Erringer, Thomas Sidney Eldredge, William Ebenezer Ellis, Elkan Washington Fishbell, Harry Maynard Fuller, Charles Frederick Freiberg, Louis Elsworth Funk, G. Walter Gray, John Dawson Griffin, Elmond Charles Gates, William Morse Griswold, George Wellington Gage, Walter Wilson Griffith, Harry Francis Holder, Charles Prescott Herbert, Gordon Ransom Hickey, Otto Charles Heine, Joseph Milton Hamilton, John Richard Hanley, James Archer Harper, William Joseph Hacking, William James, John A. Jones, Therese Kass, David Alexander Kennedy, Charles Willard Kramer, George Henry Klein, Herbert C. Kettell, William Nicholas Klumb, William Woodsworth Kenney, Christine Margaret Konantz, Herman Michael Karsten, Otto Ulysses King, Elmer Anthony Lentz, Elmer Edwin Lampert, George Buchanan McFarlane, Carl Wilson McGaughey, George Bester McKinney, Elwood Joseph Miller, Walter Garner Morris, Emma Frances Macdonald, Isaac Perkins Meredith, Melvin Edgar Merker, Edward James Martin, William Howard Overmeyer, Joseph Oettinger, Elmer Eugene Prescott, Frederick McDonald Rawlings, James H. Ridgeway, David Philip Redemann, Richard Rogers, Jesse William Ritter, Elwood Emory Ross, Joseph Clarence Robinson, Harry David Shaner Reisinger, William Nixon Ratliff, Edward Piere Skinner, Alice Steeves, John Schwartz, George Albion Stewart, James Walter Shaffer, Minna Sanner, Samuel Straith, William Prescott Scott, Elam Alden Sanderson, Isaac Sundberg, David Spar Stiver, Albert Edward Swanson, Arthur Burton Simpkins, Herbert Haze Stevens, Carl Eric William Skogsborg, Charles Albert Taylor, William Henry Thrower, George

Francis Tibbits, James N. Thompson, Stephen Edgar Thompson, William Van Hon, Otto Wolfrum, Albert Elsworth Wrixon, Levi Grant Woodruff, James Madison Weems, Samuel Flagler Walton, Eugene Edgar Willsey.

COLUMBIA DENTAL COLLEGE.

The following named graduated from the Columbia Dental College April 1, 1897, at Handel Hall, Chicago: J. C. Franke, F. V. House, Miss Augusta Hansen, Miss Jennie Cosiner, Miss Helene Schwirten, Paul Wasmuth, Rudolph Martien, Theodore Klorden, A. D. McKinley, A. C. Humelbaugh, C. L. Marsden, M. Nickerson.

NORTHWESTERN COLLEGE OF DENTAL SURGERY.

The commencement exercises of the Northwestern College of Dental Surgery were held at Kimball Hall, Monday, April 5, 1897, at 2:30 P. M. The graduates were John M. Anderson, John Davern, Michael J. Dougherty, Elliot E. LaFrienier, Orrin B. Hayden, M. D., John F. Heintz, William E. Herbert, Carl W. Hoppman, Philip J. McCarthy, H. A. McConnell, Frank E. Russell, Cyrus F. Sinclair, Herbert J. Tarr, Charles E. Winslow, Fred E. Winslow, St. L. A. Estes, D. D. S.

MEMORANDA.

Do you use antikamnia?

Dr. H. S. Lowry, of Kansas City, was at Peoria.

Price Cheaney, M. D., D. D. S., has returned to Dallas, Texas.

There were about two hundred present at Peoria on Wednesday.

The Chicago Dental Society will hold a special meeting the last of June.

Dr. J. G. Templeton, of Pittsburg, was an interested onlooker at Peoria.

Dr. W. L. Croll, of London, England, paid a flying visit to Chicago in April.

Drs. J. H. Kennerly and P. H. Eisloffel, of St. Louis, attended the State meeting at Peoria.

Drs. T. S. Hacker and Geo. E. Hunt, of Indianapolis, were visitors to Peoria. Dr. L. E. Custer was the sole "Buckeye" present.

Prof. Frank Abbott, M. D., of New York, is dead of aneurism April 20, 1897. Dr. Abbott was long the dean of the New York College of Dentistry, and an author of note.

Dr. Arthur G. Smith, of Peoria, brought the house down at the State meeting when he related the manner of his entrance to that august body. Dr. Smith read one of the best papers that we heard at Peoria.

Dr. W. A. Johnston did his level best to furnish entertainment for the visitors at Peoria. Under his guidance about thirty members visited the largest distillery in Peoria, the Atlas, with a capacity of more than 50,000 gallons of alcohol per day.

About forty new members were elected at the State meeting. The clinics were well attended and commanded the strictest attention. Many new and novel things were exhibited, including a new oven by Dr. L. E. Custer. Several new cataphoric appliances were exhibited, great improvements being noticed.

AMERICAN DENTAL ASSOCIATION.

The thirty-seventh annual session of the American Dental Association will be held at Old Point Comfort, Va., commencing at 10 A. M., on Tuesday August 3, 1897.

GEO. H. CUSHING,

Recording Secretary.

HOW TO PREPARE A CAVITY IN AN ARTIFICIAL TOOTH.

Take a small size corundum wheel and grind a cavity the size and shape you want it, then take a small discarded fissure drill and harden as hard as possible, and sharpen to a blade point by grinding on two sides, moisten cavity with campho-phenique, and by frequently sharpening the drill on an oil stone can drill retaining pits any size and depth you wish in a very few minutes, without any danger of fracturing the tooth.

S. A. WHEDON, D. D. S.

KENTUCKY STATE DENTAL ASSOCIATION.

The Kentucky State Dental Association will hold its next annual meeting at Owensboro, Ky., June 22, 23 and 24.

The State Board of Examiners will meet at same time and place. For information address Secretary,

J. H. BALDWIN, D. D. S.

307 West Broadway,

Louisville, Ky.

MICHIGAN DENTAL ASSOCIATION.

The Michigan State Dental Association will hold its annual meeting this year at Battle Creek, on June 8, 9 and 10; and we will be much obliged if you will kindly have notice of it given in the DENTAL REVIEW, in the April and May numbers. Among other attractions to entertain the members will be a hygienic dinner given at the Sanitarium by Dr. J. H. Kellogg, of Battle Creek.

Fraternally yours,

HENRY C. RAYMOND, *Secretary.*

As chairman of the invitation committee, I desire to extend a hearty invitation to the members of the dental profession to join us in this meeting, which we hope to make a grand success.

Fraternally yours,

W. Z. KING.

Chairman Invitation and Membership Committee.

1001 Valencia Street, San Francisco.

PACIFIC COAST DENTAL CONGRESS.

The time for the meeting of this congress has been changed from August 17 to July 13, 1897, (continuing four days) so as to give delegates from the East, and elsewhere, a chance to take advantage of the extremely low rates of fare offered to the Christian Endeavor visitors.

Our congress will meet the week following the Endeavor convention, and, as the rates are open to all, and cover a period of several weeks, it will be an excellent opportunity for the profession to visit San Francisco.

MODERN DENTISTRY.

Up-to-date dentistry is more enterprising than most businesses. It offers the following inducements, as I have read by circular:

From 8 to 10 all work free.

Car fare allowed within 100 miles of New York.

A written guarantee with all our work.

Teeth extracted without pain; no ether, no cocaine used; no sickness, no sore mouths.

The aged, the young, those with weak hearts or lungs, can be operated on without danger.

At great expense we have secured control of a new invention for painless filling.

Lady attendants.

We speak French.

We understand German.

Take elevator week days or Sundays.—*New York Press.*

TOO MUCH CROWNING.

An all-gold crown which is conspicuous is not only vulgar in appearance, but is one of the humiliating disfigurements of modern dentistry. It is a public exhibition of a dental reproach. It is not constructed upon the *ars celare artem* principle. If there were no other objections to the use of all-gold crowns this would in itself be sufficient. There is no possible case in which this disfigurement cannot be avoided. The conspicuous gold crown should be relegated as the exclusive distinction of people of vain and vulgar taste, and dentists who run fads on the basis of pure finance. It is, moreover, the duty of the dentist to educate vulgar people in this direction; yet the operator who would be ashamed of his work if he put a white porcelain lateral beside a brown cuspid does not seem to realize his inconsistency in making an all-gold crown neighbor to human enamel. In another way there is too much crowning. Scores of fairly good molars are ground down which should be filled. It is possible, with proper treatment and skill, to restore such teeth to usefulness and natural occlusion by good amalgam, if not by gold, and in many cases amalgam is better than gold. The day is not far distant, we trust, when these gaudy and glittering defects of dentistry—fillings as well as crowns, and indeed the insertion of any metal in human teeth—will be looked upon with the same curiosity as to-day we regard the use of human teeth and the ivory of the tusk of the elephant and hippopotamus for artificial substitutes.—*Dominion Dental Journal.*

MEETING OF MILWAUKEE DENTISTS.—THE ODONTOLOGICAL SOCIETY HOLDS ITS FIRST REGULAR SESSION.

The Odontological society held its first regular monthly meeting at the residence of Dr Arthur Holbrook, 175 Eighteenth Street. Dr. Holbrook read a paper on cataphoresis, or obtunding of pain by means of electric current. After reading of the paper those present were invited to partake of luncheon. Those who attended were Drs. Holbrook, R. G. Richter, W. C. Wendell, W. H. Carson, C. H. Richter, C. L. Backcock, L. R. Esau, E. A. Geilfuss, A. T. Holbrook, L. J. Stephen, J. T. Stuart and H. B. Wiborg. The society is organized for purposes

of scientific investigation of subjects in medicine, dentistry and collateral sciences. Meetings are to be held once a month and will be preceded by a dinner, after which papers will be read and discussed. The membership is limited to fifteen. The officers are: President, Dr. Arthur Holbrook; Vice President, Dr. R. G. Richter; Secretary and Treasurer, Dr. H. B. Wiborg; Curator and Librarian, Dr. J. S. Batchelor; Board of Censors, Drs. W. C. Wendell, W. H. Carson and E. A. Geilfuss.

ILLINOIS STATE DENTAL SOCIETY.

PEORIA, Ill., May 14.—The Illinois Dental Society adjourned this morning after selecting Springfield as the next place of meeting and electing the following officers: President, Dr. J. A. W. Davis, Galesburg; Vice President, Dr. W. A. Johnston, Peoria; Secretary, Dr. A. H. Peck, Chicago; Treasurer, E. D. Swain, Chicago; Member of Executive Committee, A. H. Allen, Freeport; Supervisor of Clinics, E. K. Blair, Waverly; Executive Council, George H. Cushing, Chicago; E. H. Allen, Freeport; A. S. Waltz, Decatur; J. G. Reid Chicago.

DENZEL'S HEMOSTATIC TINCTURE.

Bibring prepares this as follows: After mixing 10 grams pulverized ergot, 20 grams alcohol and 2 grams sulphuric acid, he pours over it 500 grams boiling water and reduces by boiling to 200 grams. Then he adds 2 grams of calcium carbonate, submit stheliquid to pressure, evaporates to 70 grams and adds 30 grams alcohol and 3 drops of essence of ginger, and sets aside to settle, and filters.—*Pharm. Ztg.* No. 19, 1897.

MECURIAL OINTMENT IN THE TREATMENT OF WOUNDS.

Majewski has been using for three years a concentrated mercurial preparation in the form of a salve, as the grease prevents too rapid absorption of the mercury. The ointment is applied in a thin layer on a piece of gauze, and very carefully restricted to the wound itself and not allowed to encroach on the adjacent normal tissue. With these precautions all kinds of abscesses, phlegmons, and wounds, contusions, etc. healed with remarkable rapidity and completeness. He reports in the *Cbl. f. Chir.*, April 10, 626 cases thus treated in 1895 and 806 in 1896, and recommends the method in high terms, to army surgeons especially. His formula is: 25.0 hydrarg. oxydat. flav. to 100.0 vaselin, applied after careful evacuation of all the pus.

OBITUARY.

DIED.—Wednesday, March 17, 1897, at 11.30 P. M., John C. Storey, M. D., D. D. S., aged sixty-one.

It is with great sorrow that we announce to the readers of the *Journal*, the death of our much beloved brother, Dr. John C. Storey, editor of the *Texas Dental Journal*, who was sincerely admired and revered by the profession in the State and entire south. He was a man of sterling worth, possessed of a tender, kindly heart, a fine mind well stored with useful knowledge, which had ever been freely given to the profession for its use and elevation. His gifted mind has been

recognized throughout the United States and his writings read with great benefit to all. He loved his profession and all who were connected with it who followed it legitimately, disliking the "quack" as bitterly as he loved the true and honest.

Dr. Storey was born in Green county, Alabama, in 1836, and his father, Dr. John C. Storey, was one of the pioneers of that State. He was graduated from the Atlanta Medical College in 1857, and practiced his profession in Green county from 1857 to 1860, and then removed to Louisiana. At the beginning of the war he enlisted in the nineteenth Louisiana infantry, and in 1862 was discharged on account of ill health. He afterward reenlisted as assistant surgeon and from this time to the close of the war he was busily engaged in caring for the sick and wounded. At the close of the war he married Miss Wiley, daughter of Rev. E. E. Wiley, of Emery, Va. Four children were born of this union—John E., Clarence L., Virginia E., and Theodora J. Mrs. Storey died June 27, 1891, and her remains were interred in Trinity cemetery. In 1867 Dr. Storey entered the Baltimore College of Dental Surgery and was graduated in 1869. In 1875 he came to Dallas and has resided here continuously since that time. He was a member of the Southern Dental Association and of the Texas Dental Association, and had served as president of each of these organizations.

Dr. Storey was a member of the Presbyterian church, having joined that denomination almost thirty years ago.

He was also a member of Camp Sterling Price, United Confederate Veterans.

The funeral services were conducted by his pastor, the Rev. Dr. W. M. Anderson, in the First Presbyterian church, at 11 o'clock Saturday morning, March 20. The church was filled with friends and relatives. The many tributes of love and respect paid to the man by his pastor, found response in the hearts of his loving friends there assembled to pay their last respects to him with whom they had worshipped so many years as members of the same body. The floral emblems were many and beautiful. The interment was at Greenwood, (Trinity) cemetery, where he was laid by the side of the wife of his youth who preceded him to the land beyond five years ago. The obsequies were in charge of Camp Sterling Price, who attended in a body to do honor to their dead comrade. Judge E. G. Bower and Rev. W. L. Lawrence conducting the burial ceremony.

The pall-bearers were: Drs. Thurston and Lane, of the Dallas Medical Association, Drs. Westerfield and Fife, of the Texas Dental Association and John J. Conroy and Major Wortham of Camp Sterling Price.

Dallas, Texas.

T. L. WERTERFIELD.

THE DENTAL REVIEW.

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CHICAGO, JUNE 15, 1897.

No. 6

ORIGINAL COMMUNICATIONS.

PRESIDENT'S ANNUAL ADDRESS.*

BY C. R. TAYLOR, D. D. S., STREATOR, ILL.

Members of the Illinois State Dental Society: With a growing desire for greater intellectual achievements and for higher attainments in our profession and believing that knowledge is the supreme test of desire, that reason is the power behind the throne of wisdom, that usefulness is the greatest and best aim of life, we have met to seek for knowledge and to reason together, with the hope of finding that wisdom which will lead us into the scientific nature of things so that, individually, we may be of the greatest helpfulness to suffering humanity in the daily application of our professional life.

Self-preservation is said to be the first great law of nature, but a greater law stands forth and says, "No preservation without progress." So the greatest law of the universe is the law of progression.

Unseen hands are constantly changing star dust into revolving planets; having within them the potentialities of all the myriad forms of life. The earth upon which we live has been evolved from the nebulous mass which contained within it all the possibilities of life which has since found expression on this globe.

The first cell or cells of organized life had in them all the potentialities of life that lies between the monad and man. That divine influence which has wrought life from the lowest living matter up to man, is still working and whether in the future there is to

*Read before the Illinois State Dental Society, May, 1897.

be developed on this earth a superior order of life form than man, only the ages can tell. There is no question that humanity as a whole, the world over, is being moved to a higher intellectual and moral height than the history of man has ever shown. Things are being done to-day under known laws more wonderful, from an intellectual standpoint, than was ever done when the gods and men walked, talked and worked together in myths and miracles.

That old Shakespearean couplet that says

"There is a divinity that shapes our ends
Rough hew them as we may,"

is scientifically true. The evolution of man from the savage or primitive man to the civilized being has been accomplished by advancing and retreating, now up, now down, and at his best man's advance has been "spiral" rather than direct. Often without any thought of his own intellectual possibilities and future, and in spite of his ignorance, the invisible hands of destiny have pushed him forward and upward, until the prophecy is now going forth that man in the future will be a six-sense being.

Now the highest and holiest duty of man is to know himself; not simply his physical form and mental characteristics, but his higher, ethical and spiritual natures.

All organized social life must be based and planned upon the theory of self-preservation and progression or it must eventually fail because of the lack of such potential power. Any special society, for whatever purpose it may have been organized, must have this potentiality of existence or prove its right to live.

Societies, like men, can only grow by looking forward. They cannot live upon the past alone, but must find sustenance in the present and have a growing desire for greater and better things in and for the future. And that brings us to the question of, where are we at? Do the eyes of this society see only the verdant fields of the past? Or do they take in with increased vision the greener hills and valleys of the present and behold with joy and confidence the emerald sheen of the future? When this society was organized, thirty-two years ago, education and professional life in dentistry was at a low state of culture, but a few large-minded progressive individual cells saw the need of progress and self-preservation of our profession and made an organization, called the Illinois State Dental Society, which has shown its great possibilities, by its constant growth and vigor.

It has been able to renew itself by the absorption of suitable pabulum and the ability to change its form under varying conditions. So long as the cell life was young and active the general organism thrived to grow. New life and vigor were constantly manifesting themselves in a bloom of youth and progress. But there are evidences that this society, which, for so many years has marched as the vanguard in professional society work shows signs of indifference or incapacity to much longer lead in the march of progress. What are the evidences of this weakness? They may be briefly stated. When this society was first founded, it not only grew in a healthy way, in numbers and enthusiasm, but the papers showed a growing spirit of original and individual investigation which has seemed not to grow in proportion with the increased experience and enlarged membership.

Not only may that be said but in its earlier existence this society had a larger growth of membership when compared with the number of practitioners in the State, than it has been gaining in these later years. This society was formed July 24, 1865, with a membership of forty-nine. There were about 400 dentists at that time practicing in the State. One hundred and twenty-five members joined the society during the next ten years. There are now 166 active members belonging to this society living in this State. During the past ten years 160 have joined the society, while there are now not less than 1,900 to 2,000 persons practicing dentistry in this State.

It is possible that the chief cause of this pessimism comes from the mercenary tendency of our professional life, in that not only the fierce law of competition is seizing the vitals of individual life, but in so doing it is destroying the energy and growth of this grand organization.

Shall this *Zeitgeist* prevail?

All organized life is dependent upon at least two conditions. First, that it can reproduce itself, and second, that it can adapt itself to the changed conditions or environments of its life. That is a universal law embracing life and society.

In the early days of this society, dental colleges and journals were few in number and less patronized than they are now. It would seem as though both of these institutions should be influences in the building up of societies such as our State and local

societies are, and that the readers of the dental magazines in this State would be almost unanimously members of this society. Yet it is possible that the very fact of nine-tenths of the reading matter in our journals being papers prepared for and read in the State and local societies and then printed in the journals, and thus practically given to the profession, is one of the reasons why our society has not the membership it would otherwise have. Because the profession at large find it cheaper to buy the journals than to attend society meetings. The average proficiency of the members of this society in the practice of dentistry, in ethics, culture and good fellowship, is superior to that of the average dentist in the State outside of this society, and that superiority is largely the result of the work done by this organization; therefore the conclusion must be reached that there is need, and a growing one, of some method by which the large number of the profession outside of this society can be reached and inspired with greater desires for a nobler, higher and better professional life than they now possess. So, then, this society must show its right to live, by its ability to change its mode of life to suit its present necessities and environments.

The preamble to our constitution says the aim and object of this society is "the promotion of the honor, usefulness and interest of the dental profession and mutual fellowship and good feeling." Those are noble ideas, but how many of us really put these ideas into actual *everyday* practice? Of course we all believe in them, once a year, when we come to our annual meeting.

Suppose we, every one of us, should all the year carry those ideas into practice. Is it not to be hoped, if that were done, that instead of there being an actual gain of five members to this society per annum during the past five years, that we could expect a majority of all the dentists in the State would be constant and faithful members of this society? It is the duty of each of us to constantly work with our dental brothers in our own and surrounding communities for the purpose of showing the mutual fellowship and good feeling that comes to those who meet here in a social and scientific spirit. Can this society—as such—do anything to change the undesirable condition among the profession at large? It can and must adapt itself to its changed surroundings if it would really fulfill its mission. It can, because a few years ago it not only changed its constitution and by-laws and mode of

work, but it put into existence four other dental societies in the State which have been giving back to the parent stem new life and renewed vigor by getting a part of their members to join the mother society. It may not be practicable, for this society to organize more societies, but it should be its mission to so fill the heart and spirit of its individual members with such a love for its prosperity and growth and for the professional salvation of those outside of its fold that they will work incessantly to reclaim the quacks and save those who are dying of inanition and dry rot. How must this be done? Just as it is done in any organism. The change in all organized life must first manifest itself in its primary structural elements, or cell life. So in all growth or changes in organized societies. The individual must do for the society what the cell does for the organism. Commence the development of the potentialities of its being. This individual work can be done by each member of this society helping to organize fellowship clubs in communities having three or more dental practitioners, and when there are less than that number in a community the dentists in several towns could unite for mutual improvement and benefit in all worthy ways and the ultimate result would be reunion in our State society. Each of us should solemnly pledge himself to do this work; if that is done and the pledge faithfully redeemed there can be no question as to the results.

At our last meeting there was a tendency manifested to hold the colleges largely responsible for the lack of professional rectitude and nonprogressiveness of the graduates from such institutions. While the colleges should be held strictly to account in their duty and responsibility in this regard, yet no thoughtful person can but conclude that there are others who are also responsible. The profession as a whole, individually and collectively, are most responsible for the quackery and unprofessional conduct of the young men just commencing professional life. As a profession we are too mercenary and in consequence too selfish.

Too many of us, when we have established ourselves in a community, in some way get the idea that the community belongs to us by right of discovery or conquest and that we are monarch of all we survey by divine right. The result is when another enters our (?) territory, especially if he is a young graduate, he is treated as an interloper—an enemy—and made to feel that he has no rights that we need to respect.

Being a young man with little money and few friends, he feels compelled by force of circumstances and necessity to get something to do, and that something, very quickly too. The result is, starts on the road to quackery and unprofessional conduct in general. Yet when he left college he had promised himself to be a true professional man and he might have succeeded in so doing had the older practitioner received him as a younger brother and welcomed him as one having the same rights that he had in that community. Such an illiberal spirit is not only narrow and selfish but it is as truly unprofessional and unethical as is the more gross form of quackery.

It is possible that original research and individual investigation into unsolved problems pertaining to our profession could be stimulated by this society giving a special diploma, prize or medal of honor for worthy inventions and original scientific discoveries. This society could do itself no greater honor and the profession no greater service, besides doing a most graceful act, than by bestowing upon Dr. Black a medal of honor for the great benefits he has rendered to our profession by his untiring zeal in original investigation.

Could not our colleges afford to lay aside a portion of their gains each year, for the purpose of organizing and sustaining a class of investigators led by such a man as Prof. Black? It must be possible that some method can be adopted whereby the young men coming out of our institutions of learning can be reached and trained and directed in original work. For there must be a good deal of latent talent either running to waste or lying dormant that should be aroused and stimulated for some great work. If some such thing could be done, it is reasonable to suppose it would meet with the hearty approval of the profession and generous financial help from individuals.

It is a grand hope and it would be a great gain to professional attainment, if this society could use its influence for the foundation of an organization that would arrange a course of studies after the plan—say—of the University Association, of which Bishop Fallows is at the head, the object of which would be to lay out a course of reading and study that would interest the profession in the pursuit of useful and scientific professional knowledge. That would in fact be a post-graduate course of study. Each member in such an organization could have given him a certificate

setting forth the studies taken, or a diploma on passing a satisfactory examination. The information, work and discipline thus gained could not but be of great gain to the individual, and which would finally reflect honor on the profession and this society. Self-culture is neglected, largely because individuals do not know how to arrange a course of study. A plan such as suggested would furnish what is lacking.

Ladies and gentlemen of the Illinois State Dental Society, let us be inspired with the duty of magnifying our calling. May our qualifications and attainments take us away from the reproach of being "tooth carpenters" and "tooth pullers."

Can we not show to the world that our profession is the most progressive, scientific and exact of all the healing professions? And that we are the peers of all the learned professions, in culture and accomplishments? Lecky in his "History of European Morals" pays our profession this high compliment. He says: "It is probable that the American inventor of the first anæsthetic has done more for the real happiness of mankind than all the moral philosophers from Socrates to Mill." That is praise indeed, for that "inventor" is one of our professional immortals.

Let us have the greatest aspiration and ambition, not simply for glory and renown, but to serve our day and generation in all worthy ways, by being faithful and true in our professional service and attainments, no matter how humble our talents may be; for he is great who is always true.

Let us believe with Emerson that

" So nigh is grandeur to our dust,
So near is God to man,
When duty whispers low, thou must,
The youth replies I can ! "

But too often the youth who under the force of duty and necessity gains, through self-denial, an education, comes to the conclusion that he knows it all or at least all that is sufficient for him to know to gain a living or still more to stand at or near the head of his profession that *that* is success in life. The idea is too prevalent in all walks of life that success consists and depends upon making money or standing at the head of one's special calling. Such ideas are laudable, but there is a grander and more noble idea of gaining self-possession and enlargement. One ties us to selfishness, the other lifts us up to the highest ideals and

gives us not only self-conquest but the universe to possess and enjoy.

The tendency of a specialty is to narrow the views and thoughts of him who practices it, making the person an intense, pointed individual, having no broad and comprehensive ideas of life's mission. One so often fails in the successful treatment of special cases through lack of a comprehensive view of causes and effects. The relationship and close contact of a dentist with his patients is so near that the dental practitioner owes it not alone to himself, but to his patrons, to be not only a gentleman, but the cleanest and one of the most learned and widely informed and cultured men in the community in which he may live. And there is no reason why the dentist cannot be such a man for his hours in the office are or should be few, so he has time for self-improvement, and all he needs is the inclination and capacity to be what his position demands of him. The ideal dentist is a person who has the head of a scientist, the nerve of a surgeon, the heart of a mother and the touch of an angel.

It is pleasing to note the general tendency of the profession toward the conservation of badly diseased teeth. This tendency is no doubt largely due to the advancement made in crown and bridge work and the more thorough and perfect methods of treatment, but there has been a steady and continuous moral growth to that end for a number of years. At the present time that growth is fostered by the dental colleges, and yet the dental profession and the colleges must take a more decided and advanced position on that subject than they have or are now doing.

There is no specialty in medicine or surgery where the practitioners or colleges of that specialty are so reckless in the destruction of the organs they are supposed to save as we find them in our profession. Would any eye and ear infirmary in the world dare to advertise the removal of eyes and ears free of charge, or at any price, that could and ought to be saved, just because they were badly diseased? Yet it is doubtful if the most advanced dental college is free from the charge of allowing and permitting the free extraction of teeth that could and ought to be saved, by students under the direction of a demonstrator, at the behest of patients. The same charges can be maintained against the profession in general. It is to be hoped that the time is not far distant when such practice will not be permitted either morally or

legally. May this meeting, which rounds out a third of a century of society work, be noted for its spirit of freedom, fraternity and faithfulness.

PYORRHOEA ALVEOLARIS.*

BY J. W. WASSALL, M. D., D. D. S., CHICAGO, ILL.

The statement was made at a recent meeting of the Chicago Dental Society that more human teeth were lost from this malady than from dental caries. The idea to me was a startling one, but a little reflection convinced me of its reasonableness. It might be more true to the facts to say that caries was the arch enemy of childhood and youth, while pyorrhœa alveolaris was the destroyer after the age of thirty. I have chosen this subject, therefore, because I am impressed with its great importance in dental practice, and because its consideration by this body will not fail to throw some light upon it.

The disease of pyorrhœa alveolaris may be discussed by dividing the subject into the following six general headings, viz.:

1. Definition.
2. Symptomatology.
3. Pathology.
4. Etiology.
5. Treatment.
6. Prophylaxis.

First, definition: The dictionaries of medical and dental science give very inadequate definitions.

Black, American System of Dentistry, Volume I., defines phagedenic pericementitis as a specific, infectious inflammation having its beginnings in the gingivæ and accompanied with destruction of the peridental membranes and alveolar walls. Dr. Black's paper at Quincy in 1882 was the first real attempt at a scientific description of this disorder before this Society. His appellation of the disease given at that time seems more appropriate philologically and scientifically, but common usage has given the term pyorrhœa alveolaris its stamp of greater authority.

Second, symptomatology. There are two classes of symptoms, subjective, or those experienced by the patient and objective, or those obvious to the operator.

*Read before the Illinois State Dental Society, May, 1897.

The most prominent subjective symptom is pain. Pain may be localized in the alveolar tissue or be reflex in remoter parts of the cranium, face or neck. It will vary in degree from a trifling uneasiness to intense suffering. The tooth, the socket of which is affected, may be elongated or tender to percussion. The patient is frequently but not always conscious of a discharge from the alveolus, having a fœtid odor or taste. The patient will usually give a history of periods of comparative comfort followed by marked exacerbation of all the painful symptoms, but each attack leaving the tooth a trifle more loosened.

The objective symptoms during an acute attack of pyorrhœa alveolaris will be the characteristic signs of inflammation, viz.: heat, redness, pain and swelling. If the disease is of long standing a deficiency of alveolar and of gingival tissue. The existence of so-called "pockets" about the gingival line is pathognomonic and the infallible diagnostic sign of the disorder. The extent and depth of pockets varies from a slight solution of continuity in the periodontal tissue to a complete severing of the roots' connection from its socket. Pressure on the gum over a pocket will produce a discharge of pus. The use of the sound or probe will reveal to the educated digit the presence of a deposit of calculus upon the cementum. These symptoms are not always constant, but are present in varying degrees according as a case is in an active or passive stage.

Third, pathology. The nature of the diseased conditions present in the acute and chronic stages of pyorrhœa alveolaris is described under the preceding heading in part and will be more fully considered under etiology.

I desire, however, to refer to a condition described by many writers which has not received a proper interpretation. I refer to the occasional presence of a deposit of calculus on the root having no external communication with a pocket or gingival margin. The statement is sometimes made that such a condition occurs and that it gives rise to an acute attack with all the usual symptoms except the absence of a connecting pocket. It seems highly improbable from what is known of the formation of pockets in pyorrhœa alveolaris that this condition could arise *de novo* as described. Is it not more reasonable to attribute the condition to nature's attempt to close up a pocket after the subsidence of an acute attack by which the deep end of the pocket—the bottom of the pocket so to

speak—is left as a cul-de-sac containing its scale of calculus on the roots together with the several varieties of pathogenic bacteria which will ultimately give rise to further outbreaks of the acute attacks? A condition of the gravest consideration under the head of pathology is the wasting of the alveolar process. This is due to the destruction of the peridental membrane which undoubtedly has occurred wherever pockets have formed. The peridental membrane is the alveolo-dental periosteum, being the periosteum of the alveolar wall next to the root as well as the periosteum of the root. Its disappearance would deprive the process at such points of nutrition and would sufficiently account for the wasting of the bony structure.

Fourth, etiology. The cause of pyorrhœa alveolaris is still involved in mystery. While there have been many theories advanced and the best thought of the profession has been given to the subject thus far nothing conclusive has been established. There seem to be advocated, first, that the cause of the disease is purely local; second, that it is constitutional, and third, that it is of local and constitutional origin combined.

The argument so often advanced that the disease must be purely local because local treatment will result in its disappearance would at first glance seem to be conclusive. But a closer examination of this claim shows its fallacy. For by the same reasoning eczema, the local manifestations of which are removed by topical treatment could be called a local affection when its constitutional origin is a well-known fact.

A more satisfactory cause to my mind is proposed by Drs. Pierce and Kirk, viz., the uric acid theory, but the value of their claims is still speculative. While I do not deny that their claim may be correct, I am not prepared to accept their proposition that the deposits of pyorrhœa alveolaris are equivalent or analogous to the calcareous deposits of the uric acid diathesis. Dr. Black has demonstrated by his analyses that uric acid may be present in all deposits upon the teeth, salivary or serumal, irrespective of the fact of the presence of pyorrhœa alveolaris. If the serumal deposits of pyorrhœa alveolaris were identical with the calcareous deposits in the joints of gouty or rheumatic subjects why is it that the deposits on the roots of teeth never occur as loose nodules in the peridental membrane? I wish to assert that I am unconvinced that pyorrhœa deposits originate *de novo* unless situated in pock-

ets. The chemical analysis of any calculus taken from an individual of the uric acid diathesis—and the uric acid diathesis is very prevalent—would naturally reveal the presence of uric acid. Would you infer that stone in the bladder and its accompanying irritation was due to gout because analysis yielded uric acid crystals? I have brought before you these few objections to the uric acid theory not because I disbelieve in it entirely but in order to show that the ground upon which its advocates stand is not yet assured.

The causative agency of the calculary deposits in pyorrhœa has always been a matter of doubt. While it is almost unquestioned that a pocket precedes the formation of a deposit, yet it is plain to every observer that the presence of serumal calculus aggravates all the symptoms and accelerates the progress of the disease. Salivary calculus is important as a predisposing cause of pyorrhœa alveolaris, in that it establishes a lesion of the gingivus, a condition favorable to the development of the disease.

I wish to suggest a constitutional disorder which seems in my judgment to bear an important relation to this affection. It is eczema. All observers seem to agree that the scrofulous tendency or dyscrasia is very favorable to the development of pyorrhœa alveolaris. Scrofulous persons are invariable subjects to impairment of the integument or of the tegumentary appendages. It may take one form or another. In one family it will be early falling of the hair bulbs; in another, dryness of the cuticle. All such are tegumentary degenerates, and it is my experience that very few cases of pyorrhœa alveolaris come under my notice in which I cannot find some indication of eczema.

The infectious character of pyorrhœa alveolaris has been noticed by many observers. Dr. Black, in his article before referred to, states it as his belief that the bacteria which are found to abound in the discharge stand in an important causative relation to the disorder. So far as I can learn, no one species has been isolated which will give rise to the disease by inoculating the periodontal membranes of the lower animals. There is here open a fruitful field for study and investigation. The disease is in all probability caused by a germ or its toxins, and it is only a question of time when the particular species will be demonstrated.

Fifth, treatment. The constitutional origin of pyorrhœa alveolaris is so much involved in mystery at this time that there

is no basis for systemic treatment. So far as I am able to learn, there is also not even an empirical method of systemic treatment of any special value. We are therefore driven to the other alternative and forced to rely on local treatment until such time as further investigation shall have revealed the truth to us.

For the same reason local treatment is carried on in the dark, but we know that in this direction only can we obtain any really satisfactory results.

When a case presents it should be the first duty to make a thorough examination. The gingivus of each tooth should be carefully sounded for pockets and when one is found its location, depth and width should be accurately indicated on the diagnosis chart.

The treatment should consist first, of the removal of calculus; second, medication; third, the securing of rest and protection.

The location and removal of calculus is often one of the most complex and trying operations the dental practitioner is called upon to perform. There is nothing I can add to what has been said upon this question. Each must put forth his best skill and ingenuity to accomplish the end sought. It is perseverance the educated digit and concentration of mind upon the cutting edge of the instrument which should mainly be depended upon.

Cocaine anæsthesia may be used in painful cases.

In some examinations of cementum of teeth affected with pyorrhœa alveolaris reported by Dr. George B. Clement at the World's Columbian Dental Congress he asserts that the superficial lacunæ and canaliculi become solidified by calcific deposit. It therefore becomes a matter of much importance after removing the serumal calculus to also take away this layer of solidified cementum. Indeed it has seemed to me that success in obtaining adhesion of the new growth of pericementum to the cementum is entirely dependent upon the ability to present a freshly exposed surface of normal cementum to the new granulations.

All operations should be accompanied with a free use of a powerful stream of warm water from a small nozzled syringe.

Medication should consist at the first visit of, first, disinfection to remove all traces of bacteria; second, of a vigorous escharotic to destroy pernicious tissue and to act as an alterative and establish a healthy action which is the proper surgical treatment for any ulcerative surface

To secure rest cusps should be shortened with the corundum, and if there is any loosening some sort of a splint should be adjusted—metallic bands, pure silver or gold preferably, or waxed silk ligatures.

The mouth is such a favorable habitat for the myriads of pathogenic bacteria that it would be eminently desirable if it were possible to seal up the external openings of pyrrhœal pockets. I have not as yet had any experience in such a procedure, but I believe it is feasible, and some effective way should be employed.

Subsequent treatment should be made with the utmost care not to break up any reparative processes which have begun. Failures are often occasioned by careless probing or uncalled for force in injecting medicaments at this stage. Search for deposits overlooked at the first treatment should not be made unless there is positive evidence of their presence by failure of the pockets to close. Disinfectants and stimulants at varying intervals of from one to seven days are indicated until a cure is obtained.

As every patient once afflicted with this disease is subject to a recurrence, prophylactic measures become an important consideration. Maintaining a robust general health, vigorous friction with tooth brushes regularly applied at bedtime and on arising—having four brushes in use so that they are not water soaked when employed—and the rubbing continued for three or four minutes, to be followed with a disinfectant mouth wash—the fluid to be retained in the mouth three minutes—are the measures from which I have observed good results. Pyorrhœa subjects should have the mouth examined for pockets every three months.

OPINIONS OF ILLINOIS DENTISTS REGARDING DENTAL SOCIETIES.*

BY E. H. ALLEN, D. D. S., FREEPORT, ILL.

I find that to arrange the opinions expressed in three hundred and sixty-five letters received in reply to the circular sent out March 1, is a difficult task.

It is of course necessary to arrange the opinions into some kind of order so that some defense can be made against the attacks on this society.

Of the three hundred and sixty-five letters received, I think

*Read before the Illinois State Dental Society, May, 1897.

that six-tenths of the dentists were members of some dental society. About three-tenths were not members and never had been. One-tenth had been members at some time, but were not at present. The greater number of replies thus received were in favor of such organizations, and believed that no particular reform was necessary; on the other hand some of these, while they were members, were not satisfied with the way of conducting dental societies, and suggested several reforms as will be seen hereafter.

I trust that no one will take any offense at anything I may have to say, nor to being quoted; nor will any one here, if quoted consider I have violated any confidence placed in me as I shall in no case divulge the name of any correspondent.

The object I have in view is to discover, if possible, why in this great State of Illinois with nearly two thousand dentists, only one hundred and ninety are active members of this society, and out of this number only ninety-six were present at the last meeting held at Springfield, 1896.

It will be remembered that two years ago, I began the work of correspondence with the dentists of this State with a similar object in view. My circular letters were limited in number to four hundred. It was thought best by the executive council that the work be continued with the view of reaching every dentist in the State. This has been done, and from the replies thus far received, (I expect them to come stringing along until next Christmas), I shall endeavor to give you the opinions thus gathered to the best of my ability.

So far as possible a copy of the following questions was sent to every dentist in this State. So, hereafter, 1st, 2d, 3d and 4th refer to the questions respectively:

1st. Are you a member of any dental society? If so, state which one; or if more than one, state the ones you are now a member of, and how long you have continued such membership.

2d. If not a member, please state your reason for not being one.

3d. Do you think attendance on dental societies beneficial to the dentist, if he goes with the desire to seek and impart knowledge?

4th. Do you think dental societies are properly conducted? If not, wherein lies the fault, and what reform is necessary?

The first group I shall consider are those who are members

of this society or some other and who are favorably inclined to dental societies as follows: "I certainly think that the dental society is one of the most important means of dental education open to the profession. They are and must be of the greatest benefit to their members, both practically and intellectually, if they are attended with the proper spirit." Another writes: "I believe on the whole that dental societies are as well conducted as we could expect them to be, considering the common faults and frailties of humanity. I have not the slightest complaint to make about any society with which I am connected. They have all done me more good than I can ever hope to do them." This is from a man for whose character and ability we all have the highest respect.

Another writes: "No man liveth to himself alone. Next after the rudiments of a dental education are obtained in college or by the study of books, the dental society is the grandest institution on earth for the dissemination of views or knowledge, and the development of one's powers in all things pertaining to the practical in dentistry."

"In the main, yes. Of course there is plenty of room for improvement, yet I know of no radical reform I would propose. I think the management of dental societies may safely be left to the processes of evolution. There will always be kickers and wire pullers, but their influence will gradually diminish before the power of a broader general and professional culture. The character of the work, both scientific and technical, done by societies has improved vastly in the last twenty years. This is shown very clearly by a comparison of the published literary work as presented before the various societies in later years with that of fifteen or twenty years ago."

"If I had a reason for not belonging to a dental society it would be the cost that is necessary for a poor man, but I think that if he can possibly raise the amount he had better do so, for it is money well expended. If the dentist goes to a dental society with a desire to gain all the knowledge he can, and at the same time has the cause of the profession at heart so that he is willing to impart to others the knowledge he has, it is my opinion that he will be benefited and also the society will be benefited by his attendance. I consider that the dental societies are next to a post-

graduate course in its benefits to the practitioners. I have no criticisms."

In reply to question, What reform is needed, if any; "Yes. If not, instead of staying away, like a sorehead, 'kicking' about it, I would adopt the same principle I do in politics—attend the primaries and fight for my idea or principle; so I would attend the dental society and fight to correct what I thought was wrong."

"I most certainly think that the regular attendance at dental societies is the duty of the dentist to his profession, his patients and himself. It is almost the only way we have of promoting a friendly feeling among members of our profession, and attendance upon the meetings of a good society cannot help improving a man's knowledge and encouraging in him a higher and broader professional spirit."

"Invaluable. Would feel justified in making considerable sacrifice rather than fail a single meeting; to miss all would be a calamity. Should expect deterioration and retrogression to ensue in a short time. I have little fault to find with the societies as they are at present conducted. The man who does not seek the societies only has himself to blame in not taking advantage of opportunities presented to him. For he would be a dull man if he would not receive much valuable aid by his attendance."

"There can be no question that attendance upon society meetings is of vast benefit to any one who does not start out with the idea that he knows it all, or that he is or ought to be the 'whole thing.' It begets a fraternal and healthful emulation and stimulates higher professional and social aspirations. A mind capable of perceiving that a thing 'may pay,' although the coin of the realm does not conspicuously appear in evidence, will after a few years of exchange of views at society meetings be forced to the conviction that time spent at such meetings has proved a most profitable investment. Fourth query: That is a matter for each society membership to determine for itself. It is largely a matter of evolution and environment. If a majority of any society thinks its particular organization is not properly conducted, it is entirely within its power to change this. There will always be visionaries and theorists who will be able to prove that if things had only been arranged thus or otherwise matters would have progressed a great deal better, and this class of good fellows many times would be of great value if they pressed their convictions within the mem-

bership and meetings. Here they could encourage the progress of evolution in a convincing, deliberative way and be met with argument that would bring to the test the truth or fallacy of the ideas advocated. Exclusion from membership or absenting themselves from meetings, compels them to hide their light under a bushel upon the only occasions where it could be seen by others, and enlighten their darkness effectively. The Illinois State Dental Society, to my mind, is the best working society of its kind in existence; it is a living exemplar of the conservative development of evolution and environment. Its methods of thirty years ago would be ridiculous to now attempt to conduct it under, and it would have been equally absurd thirty years ago to have attempted to conduct it as now. Visionaries, theorists and 'cranks' it has always had, and these are the men that by degrees have brought about change after change in our structure by carrying the majority to their way of thinking. To cut it short, if any particular society is not conducted on lines that after mature deliberation a majority decide it should be, this can easily be so changed as to fit the needs of the times and surroundings, and any one who stays away because this or that thing is not thus or so, benefits neither himself nor the world at large."

"Dental societies are, as a rule, just as well as all other organizations, subject to some limitations. We are not all-wise nor all-good, and there is a certain amount of unwisdom and imperfection in all things human."

This expresses very well the favorable opinions. I have no comment to make, only, that they are to say the least fair, reasonable and just.

Next, unfavorable opinions from non-members and their objections. "1st. I do not belong to any dental society. 2d. I have never been solicited to become a member, and it is beneath my dignity to ask for membership in any society of the kind. I have attended meetings many times. I have read the proceedings of most all of them. I presume had there been that cordiality extended that should be, I possibly would have been a member of a dental society to-day. 3d. Yes I do, providing, however, he has the proper spirit and feeling in the matter. But so many big me's go down to the meetings, consume most of the time, no one is supposed to know anything but themselves. 4th. I do not. My answer in section 3, most covers the grounds. We will say Dr.

Brown is to prepare a paper on some subject, and there will be from one hour to two taken up with a something theoretical that should be on something practical. Clinical operations, etc., would be of great import to every one in attendance. Then let reformation begin right at home in the society. Shake off all jealous feeling, leave it at home in the office when starting to a meeting, show a warm greeting to any man who will be visiting for idle curiosity, that he is welcome and at home. Hunt up those you know not. Make their acquaintance. There are thousands of good dentists who do not belong to your dental societies, perhaps from the lack of brotherly feeling. Great work may be accomplished; there is much to do, and if there was more time put in some other way to advance our calling than theorizing, I believe it would be good for all concerned."

"Because while I do not advertise, I believe in doing so should a person wish to advertise. There is too much experimenting at most of dental societies—some man trying to get his name up by doing something out of the ordinary, and as a general thing his method is no good."

"Never had time to attend and until within the last year I could see no harm in a small advertisement, but too late saw my mistake or the mistakes of others. I know of members who have paid \$25.00 for write-up, and had their cuts put in papers and journals for advertising—nothing less, and I consider this quackery as much as any kind, and I read their papers which they present to the society, and it looks as if they were the head of the society. I despise deceit and therefore I did not care to associate myself with them. The fault is your allowing one man to advertise and praise him and let him lead the profession and not allow others the same privilege. Do unto others as you would like to be done by."

"2d. Code of Ethics. Wish to conduct my business in my own way. We are all in the business for money. 'The Boston Dental Parlors' and similar affairs get the most work, and the only way to fight them is to meet them on their own grounds. 3d. Yes. 4th. Yes. Second question states my only objection. The society should not bar out printer's ink. While I do not approve of the concerns mentioned in Q. 2, I do believe in adopting their methods as far as possible when they encroach upon me. The idea that 'Cheap John' does poor work, etc., is a mistake. He is up

to date; he buys the best goods and gets the latest appliances. He is here to stay, His office is crowded with patrons. He is not a respecter of persons. He is after dollars and gets them. The professional brother who belongs to the society must let his patients go to 'John' for their dental work."

"Question 2. The dental colleges, and dental societies made a monopoly of dentistry, and law is enacted to make them a monopoly, which are not constitutional. If you will enact a law against *mal-practice* it would be more in keeping with the statutes of the country. Enclosed sample of malpractice from a graduate of Baltimore Dental College. Dentists cannot be made; they have got to be born."

"Think the dental societies are not properly conducted. The fault is this: How many dentists of a certain district discuss the questions? Only a few who are fluent speakers, and those who are supposed by the greater number as being authority. Furthermore, nine-tenths of the questions under discussion are not practicable. Have witnessed this in a number of meetings."

"2d. Well, I don't like to be interested in anything which a few men use to crowd themselves along with. (b). I detest heartily all kinds of politics in which societies appear to abound. (c). The societies do not seem to do the profession any good. They *do not* suppress advertising in the letter or spirit of the 'Code of Ethics.' The old and established practitioner says: 'The parlors don't hurt me.' The young men have no money to fight them. (d). The leading men in the societies are very often members of those unmitigated humbugs, 'The dental faculties,' which are usually composed of a lot of money grubbing dentists who dare not advertise themselves for fear of the sneers of their brother dentists, but who advertise (for patients) their schools *and treat all* persons rich or otherwise who present at "the cost of materials only" which is a lie on the face of it. (e). I can learn more by reading a paper and studying the cuts, and can form a clearer idea of it than I could by listening to some man's bombastic, positive statements and bad delivery while seated in a smoked dimmed atmosphere among a talking crowd of men, many of whom were still partially under the influence of last night's drinking. This of State societies. (f). At the few meetings I have attended, I have been struck by the difficulty of seeing or hearing the clinics without fighting for a place. (g). Societies, as I read them, and as I have

seen them in the two or three that I have spent time to visit, are principally 'mutual admiration societies.' Very fine for the admired, but not worth my time and money. (h). Don't believe from reading the published transactions of societies, that they are worth the money spent in car fare, hotel bills and loss of time. (i). The societies don't seem to be able to print their own circulars and notices, but sponge it out of some supply company who in turn must, per force, mulct the whole body of working dentists for an extra profit to cover these expenses. I am inclined to think on the whole that State societies are better for the dental supply houses than the dentists. Under (d), I would say, *all* are not quite so bad but none turn away people able to pay and all make money out of the infirmity.

"3. Yes, to some extent, 'but the best men—I mean the most particular honest, upright, painstaking, gentlemanly, professional spirited dentists—do not make money enough to spend their time in giving clinics away from home, so we have a good many fellows who talk and demonstrate, but teach nothing.

"4. Not attending societies I am not prepared to speak of conducting them—I don't know. Now, my friend, I have written just as I felt. I do not know who you are—never heard of you—so if I have tread upon your toes, it was unintended, and I beg your pardon sincerely. But I don't believe you belong to the class I have had in mind, who are ever crowding their shallow, but cunning and tricky heads under our noses and hiding the sun. A good society having good clinics—not too many, but good ones—clinics the work of which all men could look at and resolve to imitate, in their practices, clinics which could be seen in actual progress and by an assistant also on an enlarged scale either on a huge plaster tooth with huge wooden instruments, or on a black board by a good "diagramer," both proceeding in concert step by step—such would be a good thing if it could be had without neglecting one's practice too long. If I could get at you, doctor, I could make myself understood, but paper and ink are poor conversationalists. I thank you, doctor, for the invitation to Peoria, but will be unable to attend—because I do not feel justified in expending that amount of money for what I can easily and quickly get from journals a month later."

"No. 1. Would say member of none; was some years ago a member of the 'Chicago Dental Society.' 2d. I have no time

nor money to pay out for no adequate return. 3d. Would be of no interest or benefit to me who have practiced thirty-five years, except it might be, to inspect new inventions and appliances as on exhibition, or to behold some extra and new clinical operation. Seeing how other men do it would no doubt be a help or give ideas to a young practitioner or a new graduate, (and they never learn much at a dental college), also for notoriety or to get their name in print, all this, I myself don't hanker after. 4th. Too much 'gas,' too much jealousy, too much 'big head,' too much selfishness. Dental societies should be radically reorganized, meet once or twice a year purely to help one another in the knowledge and elevation of dental surgery."

"My reasons are many—one reason is they are run and ruled by men who never miss an opportunity to advertise themselves in almost every way, and yet lay down a set of rules taking away that right from members. Another is the meetings are held at the time of the year that I have always been the busiest. 3. I do. 4. I do not. They allow in many instances a lot of old fossils who have outlived their usefulness to take up the time with quack ideas and operations that are a disgrace to the profession and enough to disgust any man who tries to be up to date. I think those old fossils ought to be ruled out. This probably is not so much the case in the State society as it is in the district societies."

"By watching the working of members I have never been led to see any benefit in becoming a member. 3d. If a dentist has a lucrative business it is somewhat of a question whether he would derive benefit enough to leave his work to attend, even though he would go with a desire to seek and impart knowledge."

"Take two dental journals and always read of meetings—saves time and expense. 3d. Decidedly beneficial. 4th. Yes."

"Will say for No. 1, no. No. 2, never was asked to join, and too busy to pay much attention to the matter. No. 3, yes. No. 4, don't know anything about them; have read the reports only, and find that nearly all of the members are of different opinions. Would be pleased to hear of the objects of the society."

"I have no particular reason for not being one, only that I never have cared to join. I have been to some meetings but have never derived any particular benefit from them. 3d. I presume they might be of some benefit, as one might get some new

ideas, but as a general thing most of us have had some fixed way of doing things and do not like to try any experiments."

"No. 1. No. No. 2. I think they are generally—the State may be an exception—just simply mutual admiration societies where a lot of fellows like the notoriety of telling to some others, who toady to them, what they know, getting at last where the orange is sucked—the pleasant title of 'Has Beens.' 3d. Yes, I think all are benefited. 4th. Never saw one where they didn't fight like cats and dogs, and backbite each other fearfully."

"In reply to the questions I will state I belong to no dental society and never did. My reason for not being, takes time and money, and I think I reap the benefit from dental journals. I think it a benefit to any dentist to seek and impart knowledge, but what I think is more necessary is a law to govern the practice of dentistry in our State, when any man can take six months' demonstrations under another dentist and practice in any part of the State, and the State board stand up and protect him by giving a temporary license just to get \$10; why should I take any interest in dental societies which are led generally by our State board men?"

"To your first I must say I do not belong to any dental society. To your second I will answer at length, as follows: During the thirty-five years of experience of picking my daily bread out of other people's teeth, so to speak, I have attended possibly ten conventions with a view to becoming a member or attempting to do so. Have been impressed with the want of proper organization of the meetings. The average Dental Society meeting will never be complete without one more official than is generally required by deliberative bodies. I hardly know just what his official title should be, but I know very well what his duties should be. He should occupy a central position in the room and be thoroughly competent to lasso and quietly drop out of the window (the higher the better) just about four-fifths of the conceited damn fools that occupy the time of most of the conventions. This done, he should be equally competent to drop his lariat over the heads of any of the men of ideas and bring them to the front for the profitable entertainment of the assembled multitude.

"2d. The only way I would be benefited by membership of a dental society would be in the knowledge received by actual attendance at the meetings. I attend the meetings as often as cir-

cumstances permit and get as much benefit out of the meetings as if I were a member. I would be glad to assume the responsibility of membership paying my share to the support of the society and imparting what knowledge I have for the common good—all justly due for the benefits I derive, were it not for what I consider an unreasonable demand—that I agree that the ‘code of ethics’ shall dictate to me how I shall advertise my business. I am not practicing alone for the ‘glory’ of the profession, or alone for the good of mankind. Were it not for the money consideration, I would be in some other business. At the same time, I am sure that the dental profession is receiving more ‘glory’ and mankind receiving more benefit from my being an ‘advertising dentist’ than if I were one of those hypocritical, deceitful cusses claiming they are working principally for the ‘glory’ of the profession and the good of mankind. It is but a matter of prudence to put your hand on your pocket book when in contact with such deceit. I am unalterably opposed to the ‘code of ethics.’ You can’t make a gentleman of a bear by any set of rules, nor can you make a mean degraded man a gentleman by any set of rules. The ‘code of ethics’ is being continually broken and very few have enemies in the society who will produce the evidence to convict. I am opposed to the whole contemptible mess. I believe each man should stand before the public on his own merits unhampered by any rules, allowed to conduct his business as he sees fit. A right to which every citizen of our country is entitled. The public very soon puts a just estimate on every man. Well, I could write page after page of objection to the ‘code of ethics,’ but I will dismiss the subject hoping I have made myself understood as to stating a reason why I am not a member of a dental society.”

Of this class of opinions I have given you enough, and these are only a few of the many similar ones.

I don’t know as I have any comment to make on these now—would prefer to leave that to you who are present here with me.

Another class are those who, while they are not members of any society, think highly of such organizations but for various reasons have not as yet become members. In answer to first query one writes “No.” Second. “Neglect.” Third. “Too much theory.” In reply to invitations: “I never miss one.”

“Have found it too expensive a luxury for ordinary practice. Third. I most certainly think societies of greatest benefit when a

dentist goes for that purpose. In my own case have found them very beneficial and delightful. Fourth. I do not feel competent to criticise conduct of societies to any great extent, but would say I do not approve of any examinations or restriction of members. The more ignorant the dentist the more need of educating him and the more credit to the profession to enlighten him than to exclude him."

"I am not a member of any dental society. Second. The only reason I have never joined any society is that I never had the money to spare since I graduated; also no one has ever asked me to become a member. Fourth. I have no fault to find with the conduct of societies, unless it would be allowing so many dead head, nonjoining dentists like myself to attend and crowd the clinicians to the annoyance of those that join and pay the bills, but of course the society must have new members and therefore it is necessary to give some latitude in this respect, also to accomplish the object of the society, viz.: raising the standard and skill of the profession."

"My answers are as follows: I am not a member of any dental society and I never was. 2d. I have no reason. I have been in this State but eighteen months and last year I was advertising, so I knew that it was useless to apply for membership until I had reformed. At present I think I am eligible. 3d. I do not think it could be otherwise than beneficial. A man must be a conceited bigot who thinks otherwise. 4th. I do not know enough about your society to say whether it is properly conducted or not. We need dental societies. God help us if ever there comes a day when there are none!"

"I have not had time or money to join one. 3d. I think a practical dentist as well as a theoretical one can gain more knowledge from a well conducted meeting of a society, and think this is what the dentists of Illinois need more than any one other thing. 4th. I am not well enough acquainted with the doings of the association to know, but my idea is that there should be some protection against advertising officers and unscrupulous persons claiming to know something of our profession."

"I herewith make reply to your circular letter, thanking you for your invitation, which, I am frank to say, is the first invitation ever received to attend your society. The above, in my mind, is

one weak point, viz., the failure of the society to create an interest in their work."

This class have felt the grind of "hard times" which is of course a reason which must be left to their own judgment.

But as to a lack of previous invitation, I don't think that will hold good, as I am sure that every program sent out for some years past has had a cordial invitation to all the dentists in the State to visit and join the society at that meeting.

As to the Illinois State Dental Association regulating prices or fees to be charged, that is out of the question, as no society of any kind has such an authority, as that would exceed the authority of the legislature; and as to the advertising the society can only apply the much objected "code of ethics" and expel such members as persist in such a course.

It seems to be the opinion that the Illinois State Dental Society has unlimited resources of power; they think that the society can regulate the actions not only of its own members, but of the dentists throughout the State. This of course is a mistake. The Dental Society has for its prime object the organizing of the dental profession for the purpose of mutual benefit and education in dental science, and not for the purpose of creating offices to be filled by its members for the main purpose of placing them in power. Then again, as to what has been intimated in the opinions just quoted, that the society is run by a favored few or clique of members who see to it that they and their friends are elected to fill all the offices and supply all the clinics, prepare all the papers, and run the society generally. Now if this came from those who are members of the society such a statement might carry with it some force; but as on the other hand these objections and complaints come from the class of men who are not members of any dental society, the objections fail to carry with them the weight they might have. It will be remembered that the opinions quoted from those who are members of the Illinois State Dental Society are almost all of them in favor of the dental societies and their objects, and while they may differ slightly in their ideas as to the management of such societies, the consensus of their opinion is that the societies are conducted properly and they have no complaint to make. Now if there is any reason to be given why it is apparent at times that a certain class or clique as they may call it, seem to be running the society, that can best be answered by the

complaint made by the chairman of the executive committee and the superintendent of clinics. These two committees tell me that it is the hardest work to get up a program for the society because of the persistent refusal of the members of this society and others of the profession to take any part either by preparing a paper or giving a clinic, and so they find that at the last moment they must fall back on some of those who are always willing to work and do their share and more too, in carrying on the work of the society. We can see then that it is this indisposition on the part of the profession to do any society work like preparing a paper or giving a clinic that makes the government of the society seem one-sided.

Another criticism is, that the discussions on the papers read before the society are all carried on by a few men, who have the gift of eloquence which our friends who make so many objections and complaints call the "swelled head." Now just imagine what the effect would be if the same gentlemen referred to as having so much to say should simply keep their seats and have nothing to say like you who are making these objections and calling names. Would anybody derive any particular benefit from the convention of such a society? So, then, as I happen to know these willing talkers are compelled sometimes to get up and say something whether they feel like it or not. But then these objections will not hold good, because take the proceedings of any year of the Illinois State Dental Society and they will compare favorably with the proceedings of any other dental society extant.

Suggestions were made that annual dues were too high. This has been considered by the executive council with this conclusion: that a reduction of \$1.00 would not be enough to materially increase the membership; further reduction the society cannot stand. My opinion is that when the State society grows in membership to four hundred or five hundred, the time will then come for a considerable reduction of the annual dues.

It is not my intention to comment at any great length upon the opinions expressed by this correspondence. I wish to say that I have no disposition to ridicule or make sport of any of these opinions, as I believe every man has written me his honest and candid opinion in answer to the questions sent to him for reply. The objections treated in this correspondence should be treated with consideration, and while they differ widely from my own opinions, I must in fairness accede to them the rights I claim for

myself. I also find that in the quotations which I have given you in the forepart of this paper, there is too much for me to answer in a paper of this kind. I hope that we will bring it out in the discussions, and as to any recommendations for increasing of membership of the society, I do not feel as if I would care to make any. Having gathered together the material for this paper and given you that part that is best to use, and as the paper is now of considerable length, I will leave it in your hands for discussion, closing by making the observation that it is impossible to organize an Illinois State Dental Society consisting of two thousand members, taking in every practicing dentist in this State, as many of them are incompatible in temperament with any one else. But I see no reason why the Illinois State Dental Society should not number five or six hundred members and every one of them active workers.

THE STRUCTURE OF THE PERIDENTAL MEMBRANE.*

By F. B. NOYES, D. D. S., CHICAGO, ILL.

I am to present to you this evening, as clearly as I can, by the aid of charts and drawings, the structure of the peridental membrane.

A knowledge of the structure of this membrane is perhaps of more practical importance to the dentist in his treatment of conditions of the mouth, than that of any dental tissue except enamel. It makes little difference as far as the shaping of cavities and method of excavating is concerned, whether the operator has a minute knowledge of the structure of the dentine or not. Conditions of the pulp, which require a minute knowledge of its structure for diagnosis, are comparatively rare, but every operator is very often called upon to diagnose alveolar abscess and differentiate between that condition and inflammation or hyperæmia of the pulp. Without a knowledge of the structure of the membrane this differential diagnosis is impossible. To safely separate the teeth for operation, either immediately or slowly, demands a knowledge of the membrane and its relation to the alveolus. The correction of irregularity, and facial orthopedia are based upon the study of this membrane. The force of occlusion, and consequently the force which will be brought against fillings is determined by the strength of the fibers of the membrane.

*Read before the Odontographic Society.

In presenting this subject to you I have nothing new to offer. It is to be simply a presentation of what has been already determined. In the past two years I have undertaken to review, so far as I was able, the work of Dr. Black on this subject, and which he most admirably presented to the profession in his book, entitled "The Periosteum and Peridental Membrane."

The teeth must be regarded as independent organs, held in their position, in the bone, by a fibrous tissue. They are related to the nails and the hair. From the standpoint of comparative anatomy they are analagous to the dermal scales of such animals as the sharks and rays. They are composed of a calcified tissue derived from the epithelium covering a calcified tissue derived from the mesoblast, but these facts are of more scientific than practical interest. The fibrous tissue filling the space between the tooth and the alveolus has been variously named. Alveolo-dental periosteum, alveolo-dental membrane, pericementum, or peridental membrane. Writers on general histology have usually called it, simply periosteum, but this tissue is so far specialized that a name indicating the periosteum does not give a full idea of its structure. The membrane not only fills the space between the tooth and the alveolar wall, but surrounds the tooth for a considerable distance below the margin of the alveolus and supports the gum about the neck of the tooth. The fibers of the membrane are larger, stronger and more numerous than those of the periosteum in any of its attached portions. The tissue contains structures of a glandular nature, which are never found in the periosteum, and its functions are not analogous to those of the periosteum in any portion.

The peridental membrane performs three functions. (1). A physical function—that of holding the tooth in position. (2). A sensory function—it is the seat of the sense of touch for the tooth. (3). A vital function—the formation of bone on the surface of the alveolus and the formation of cementum on the surface of the tooth.

The physical function first attracts our attention. It is a fibrous membrane made up almost entirely of white fibrous tissue; the elastic fibers seem to be almost if not entirely absent; at least when the white fibers are dissolved by reagents no elastic fibers can be seen, as in tissues containing both. The fibers are of two kinds, the principal fibers, as Dr. Black has called those which

arise from the cementum, pass across the membrane and are attached to the wall of the alveolus, or are blended with the fibrous mat of the gum, and which hold the tooth in position, and the indifferent or intermediate fibers, which fill up the spaces between the principal fibers and surround and accompany the blood vessels

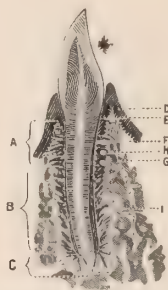


(1). CROSS SECTION OF THE MEMBRANE IN THE GINGIVAL PORTION.

The section was cut across the central and lateral incisor of a lamb, just missing the alveolus.

(a) Epithelium covering the gum, showing horny and deep layers. (b) Glands. (c) Fibers that run in a plane at right angles to the section. (d) Pulp. (e) Cementum. (f) Dentine.

and the nerves. We will first consider the principal fibers, their origin, direction and nature in different portions of the membrane. The arrangement of these fibers is exceedingly complicated. For convenience in their study, we divide the membrane into three portions.



(2). LONGITUDINAL SECTION OF A LOWER INCISOR OF A LAMB.

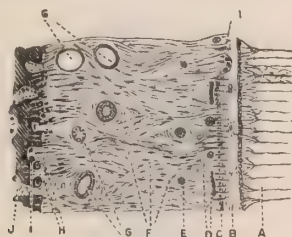
(a) Gingival portion. (b) Alveolar portion. (c) Apical portion. (d) Epithelium covering the gum. (e) Epithelium lining the gingival space. (f) The Glands. (g) Bone of the alveolar wall. (h) Blood vessels cut across. (i) Blood vessel entering the membrane through a haversian canal in the alveolar wall.

The gingival portion which surrounds the neck of the tooth, below the margin of the alveolus.

The alveolar portion, that between the margin of the alveolus and the apex of the root.

The apical portion, that filling the apical space.

In the gingival portion the fibers are firmly attached to the cementum, literally springing out from it. Their mode of attachment we will study in detail later. The fibers after emerging from the cementum usually break up into fasciculi of smaller fibers which pursue a parallel course, passing around blood vessels and nerves and finally blending with the fibrous mat of the gum, and being again united are inserted into the cementum of the adjoining tooth. This drawing (Fig. 1), represents a section cut across two teeth in this portion of the membrane. On the labial aspect the fibers will be seen to pass directly outward and blend with the fibrous tissues supporting the epithelium. As we approach the proximal surfaces the fibers bend around laterally, and pass directly from



(3). A CROSS SECTION OF THE MEMBRANE.

(a) Dentine showing tubulii. (b) Cementum. (c) Cementoblasts lying between the fibers. (d) Glands. (e) Nerves cut across. (h) Osteoblasts. (i) Areas of absorption, showing osteoblasts lying on hollows in the bone or cementum. (j) Bone of the Alveolar wall.

tooth to tooth, being deflected to pass around blood vessels, nerves and fibers which pass in a plane more or less at right angles to the section. As we approach the rim of the alveolus the fibers passing outward first decussate with, then blend with fibers arising from the bone and pass upward to support the gingivus or the free margin of the gum about the neck of the tooth. These fibers form a strong layer or band which has been termed the dental ligament.

In the alveolar portion the fibers first pursue a course somewhat inclined upward, that is, passing from the cementum to the alveolus they are inclined toward the apex of the root; a little farther up (toward the apex) the fibers pass directly outward at right angles to the long axis of the tooth. In this portion of the membrane the fibers are very numerous and strong, and, more fre-

quently pass from the cementum to the bone without breaking up into smaller fibers. As we approach the apex, the fibers become inclined more and more, and in passing from the cementum to the bone they are inclined toward the crown of the tooth and they show a tendency to form into fasciculi, which spread out in a fan shape. The spaces between these fasciculi are filled by the indifferent or interfibrous tissues made up of smaller fibers often running in a direction different from that of the principal fibers, and connective tissue cells.

In the apical portion the arrangement of the fibers is very irregular. They usually arise from the cementum in strong bundles pass outward in strong fasciculi which spread out in fan shape to be attached to the bone.



(4). AN OPTICAL SECTION OF THE MEMBRANE, SHOWING THE ARRANGEMENT OF THE GLANDS. (DRAWN BY DR. BLACK).

If we consider the fibers from the standpoint of their function, that of holding the tooth in its position, we will see that their arrangement is the very best which could be devised. In the gingival portion they blend with fibers from the bone to form a strong ligament which holds the gingivus against the neck of the tooth. Near the rim of the alveolus the fibers are very strong and pass horizontally outward to support the tooth against lateral strain; farther down in the alveolar portion, the fibers are arranged so as to swing the tooth in its socket, supporting it against the force of occlusion, which would tend to drive it into its socket and crush the delicate tissue in the apical space.

This drawing (Fig. 2), of a longitudinal section of a tooth and alveolus, represents the arrangement of the principal fibers, and gives a general idea of the membrane; the drawing is made from a section of a temporary incisor of a lamb. The bone is very open and

spongy and many blood vessels pass into the membrane from the haversian canals, which open into the alveolus.

The nature of the fibers is quite different in different parts of the membrane, and in the same portion in different periods of life. In general the fibers springing from the cementum are smaller, more thickly placed and break up into small fibers sooner than those springing from the bone. Usually the fibers springing from the cementum very soon break up into bundles of smaller fibers, which branch and unite with the others so as to lose their identity in the central portion of the membrane. As they approach the bone of the alveolus they unite again into larger fibers to be attached to the alveolar walls between the osteoblasts. Here and there single fibers may be seen which pass across without so breaking up. This is especially common in the portion near the margin of the alveolus where the single fibers are largest. Near the apex the small fibers arrange themselves into broad fasciculi spreading out in a fan shape, with indifferent fibrous tissues between them.

The cellular elements of the peridental membrane are of five kinds:

1. Fibroblasts,
2. Osteoblasts,
3. Cementoblasts,
4. Osteoclasts.
5. Glands.

The fibroblasts are spindle shaped cells which accompany and lie between the fibers. In specimens which are stained with a nuclear tinting dye the fibers are clear and their course is only marked out by the cells which lie between them.

The osteoblasts are cuboidal cells, which cover the surface of the bone, lying between the fibers. They are exactly similar to the osteoblasts in attached portions of the periosteum.

The cementoblasts cover the cementum lying between the fibers. They are always flattened and irregular in outline, their margins being notched to fit around the fibers. These cells form the cementum, building it up around the fibers and including them in its calcified structure.

The osteoclasts are the cells which dissolve and destroy calcified tissues. They are always found in the peridental membrane in some portion, though their presence seems to be very irregular. In cutting sections of an entire tooth areas of absorption are

almost always found. In these areas the osteoclasts, large cells with many nuclei, are seen lying in depressions which they have scooped in the bone or cementum or dentine. In these areas of absorption the attachment of the fibers is destroyed. If the cause of the absorption is removed the cementoblasts begin to form cementum, filling up the depression and reattaching the fibers by building the cementum about them.

The glands of the peridental membrane. These have been almost universally overlooked by students of dental histology. No one but Dr. Black has described them, and since his work no one has recognized their presence. In sections prepared in the ordinary way they are not the least conspicuous element, and their glandular nature is very apparent. In cross sections they appear between the fibers and very close to the cementum as groups of cells more or less circular or oval in outline. Quite often they appear as lines of cells passing out from the cementum. The cells are epithelial in character and are included in a very delicate membrane. Dr. Black originally described these glands as lymphatics, of the nature of what Klein has called endolymphangials—that is, minute lymph channels filled with lymphatic cells.

The glands form a close net-work surrounding the root of the tooth, most dense toward the gingivus and becoming more open as you approach the apex of the root. In a section of an incisor of a sheep cut in the gingival portion I have counted over 175 cut across.

The function of these glands is a subject for further research. No ducts opening on the gingival space have been demonstrated. Many investigators have assigned to the epithelium lining the gingival space the function of a gland, and close clinical observation seems to show that a slight secretion is poured out into this space between the free margin of the gum and the neck of the tooth, but it is probable that these glands are responsible for it rather than the epithelium. It is probable that these glands are the seat of the peculiar disease of the peridental membrane called by Dr. Black phagedenic pericementitis, and which he distinguishes carefully from other inflammations of the membrane. He has one specimen in his collection, made from a cuspid tooth, extracted from a mouth in which several teeth had been lost from this disease, but this tooth had no pockets around it, and showed only a slight redness of the gum margin. On microscopic exam-

ination the glands near the gum margin were found to be in a state of suppuration, and for a surprising distance toward the apex of the root showed signs of degeneration. It is these glands that are first affected in mercurial salivation and in other inflammations of the peridental membrane from purely systemic causes.

There is much work still to be done on these glands, and many questions suggest themselves which can only be answered by long and painstaking experiment. Do they produce a secretion, and is it poured into the gingival space? If they are the seat of phagedenic pericementitis, what causes the condition in them? Have they anything to do with producing conditions of the mouth in which caries is rapid and extensive, or in which the individual is rendered immune from caries? These glands are sure to occupy the attention of the profession in the future.

The peridental membrane is quite richly supplied with blood. One or two large vessels enter at the apical space and immediately break up into several smaller ones; one or two of these enter the pulp through the apical foramen, the others pass downward along the root, supplying the membrane with a fairly rich capillary plexus. As they pass downward they receive branches which enter the membrane through the sides of the alveolus; these branches are sufficient to maintain the size of the vessels. When they reach the margin of the alveolus they receive several branches from the gum tissue. The importance of this double blood supply is very apparent. If the vessels entered at the apical space only, the disturbance of the tissue there, such as occurs in alveolar abscess, would cut off the nourishment from the membrane and the tooth would be lost, but the lateral circulation is so rich that even when the supply entering at the apical space is entirely cut off, and also that from the gum margin is seriously impaired, the health of the membrane is retained, and the tooth remains firm. The blood vessels are usually found near the center of the membrane, or a little toward the alveolar wall. As age advances they come to lie closer to the bone and in old persons are often seen to lie in grooves in the wall of the alveolus.

The nerves accompany the blood vessels and are distributed in a similar manner. The nerve endings have not been investigated. Dr. Black has found a few Bacinian corpuscles, but aside from those, special nerve endings have not been found in sufficient number to indicate that they are essential.

As age advances, marked changes occur in the peridental membrane. In the young subject it is thick, and the space between the cementum and the alveolus large. There are a large number of cellular elements, the fibroblasts are numerous and the spaces between the fibers are filled with embryonal cells. The blood vessels lie near the center of the membrane and form a rather vascular area there. The course of the fibers is rendered complex in passing between and around these vessels. The number of glands is great: the thickness of cementum very slight. As the tooth grows older cementum is formed in consecutive layers upon the root by the cementoblasts and bone is formed all around the alveolus by the osteoblasts, so that the space between the root and the alveolus is diminished and the thickness of the membrane decreased; the blood vessels come to lie closely to the bone, often even lying in grooves on its surface. The number of cellular elements diminishes and the fibers become more conspicuous. The number of glands decreases somewhat.

The attachment of the fibers to the bone and cementum is similar to that of the fibers in the attached portions of the periosteum. In studying a section of cementum the fibers are seen penetrating it to the first layer next to the dentine and part way through that. They are not continuous all the way in all cases. Often they can be followed to a certain layer and beyond that there is a break, the fibers in the deeper layers following an entirely different course. In areas where absorption is going on, although the fibers are cut off from their attachment, the residual fibers are left in the cementum.

When the process of repair begins in an area of absorption the cementoblasts begin to form the matrix for the cementum around the ends of the fibers which have been cut off, building them into its substance and then superintending the deposit of lime salts in the matrix and the fibers which have been included in it. If the absorption occurs in the bone on the surface of the alveolus the osteoblasts build up bone around the fibers in the same manner. This solid bone is exactly like the subperiosteal bone in the attached portions, but this solid bone never reaches any great thickness. It is soon invaded by osteoclasts which cut out channels in it and destroy the residual fibers, then the spaces are filled up by bone laid down in concentric form, the haversian system lamellæ. In the eruption of the teeth the layer of bone above the

tooth is removed by absorption and bone is built in below in exactly the manner that has been described. In regulating teeth absorption occurs all along one side of the alveolus and building of new bone on the other. All the fibers are never detached at one time. While they are being detached at one point they are being reattached at another, and so the process goes on, always retaining the attachment of a certain proportion of the fibers. For this reason movement must not be pushed too fast or too much irritation will be set up, too many of the fibers will be cut off, the tooth will become loose and elongate, being pushed out of its socket by the thickening of the membrane caused by the inflammation.

When the tooth is erupted, a hole in the bone is made by the osteoclasts large enough for the passage of the crown and this leaves the space between the root and the margin of the alveolus quite wide after eruption is completed. The membrane fills this space and consequently is very thick.

The first action of the osteoblasts of the membrane is to reduce the size of the alveolus by forming layers of bone and so thinning the membrane. But there is another and important change in the alveolus which carries the tooth downward and forward and constitutes one of the important elements in the lengthening of the face which occurs in the development from childhood to maturity. The absorption and rebuilding of bone and cementum seems to be constantly going on at some point in the membrane to accommodate slight changes of position. On the surface of the root absorptions almost always appear. At about the time the tooth first reaches its opponent such absorption areas are especially common, probably caused by slight movements required to bring the cusps into full occlusion. When absorption ceases repair of the breach begins and cementum is laid down in regular lamellæ filling up the space, but a record of the action is left in the calcified tissue.

In closing, let me again briefly state the functions of the membrane and its structural elements.

Functions.

1. A physical function—to hold the tooth in position in the jaw.
2. A sensory function—the sense of touch.
3. A vital function—the building of bone and cementum.

The structural elements of the tissue are: 1. Fibers—principal fibers, those which are fastened to the cementum at one end and to

the bone or gum at the other, and perform the physical function of the membrane. Indifferent fibrous tissue, filling up the spaces between the principal fibers. 2. Osteoblasts—forming bone. 3. Cementoblasts—forming cementum. 4. Osteoclasts—dissolving bone or cementum. 5. The glands of the membrane. 6. Embryonal cells—lying between the fibers in young tissues.

THE GENERAL CONSIDERATION OF PLATE WORK.*

By W. M. BARTLETT, D. D. S., ST. LOUIS, MO.

Last year there appeared in the *Ohio Dental Journal* an article written by a dentist whose name has escaped my memory, headed "The Way to Elevate Dentistry to a Profession."

The writer says that to accomplish this dentists should discontinue that part of the mechanical branch of dentistry which pertains to the making of plates, and should turn this class of work over to some person who has learned the trade of plate making, just as a surgeon turns his patient over to a cork leg maker after he has amputated a limb. He says that professional dentists should only prepare mouths for plates, and then their duties in that line should cease. Why should they not prepare cavities for gold and send their patients to a gold pounder, just as they would send their patients to a plate maker? To properly prepare a mouth for a successful plate one must be a successful plate maker himself, and the idea of the tooth filling dentist as to how the mouth should be prepared might not meet the approval of the plate maker. Many a poor devil who has had a limb taken off by a surgeon of no mechanical ideas has had to go through life without the aid of an artificial one, while had that surgeon made a study of cork legs he would have left a stump which would have met all the mechanical requirements.

The gentleman seems to think if he should be found making plates in his office he would lose his professional standing. I do not think that a man who makes a study of both branches of dentistry will lose his professional standing any sooner than one who devotes his whole attention to operative dentistry. I say to be a successful dentist one should make himself as proficient as pos-

*Read before the St. Louis Dental Society.

sible in both branches, and in doing so he need have no fear of losing either his professional or social standing.

Again, I do not think one branch is to be looked down upon more than the other. The man who makes a success of the one is entitled to as much praise and as high standing in the profession as he who makes a success of the other. The advance of dentistry to its standing of to-day is wholly due to the men who were thorough mechanics, as they have done more to elevate the profession than those who have had only one idea. It was the dentist who was a mechanic who mastered the science of orthodontia. 'Twas the man who was a mechanic who gave us our first crowns. And all the numerous advances made in dentistry in recent years—advances which have really placed the calling of dentistry in the rank of a profession—originated with men of mechanical ability who first began to develop their mechanical ideas by making plates in some laboratory such as our fine gentlemen of to day seem to regard as a disgraceful addition to their offices.

I am sorry to see dentists as a whole losing their interest in the plate making department. I say plate making department, because I think it is the only way to distinguish the two branches, as one is as much mechanical as the other. The only reason I can ascribe for such a state of things is that it takes longer to become proficient in the art of plate making than in that of tooth filling. This is easily shown by the work done in our colleges. A green student may enter a college, and after taking three courses I venture to say that he can fill a tooth that would do him credit and make at a plate that would do him discredit. I say make at a plate. I need not go that far, because he can hardly take an impression to make a plate upon.

Another cause I can lay at the doors of our dental colleges. They do not make the proper attempt to teach this branch of dentistry. The students do not seem to take to it as they do to filling teeth. They would take to it if they were compelled to make, say ten plates before they could come up for examinations, just as most colleges exact a certain number of fillings. It is true that if the colleges exacted ten plates from each student I fear they would play a losing game, and, no doubt, this is one of the chief reasons why colleges do not compel students to take a greater interest in such work, fearing that the failures would soon bank-

rupt them. Not only are they not exacting enough in regard to their students, but in the past few years they have cut down lectures in mechanical dentistry (as they call it) to only two sessions. If a professor can lecture before a class for three sessions on tooth filling, one could surely lecture on plate making and all its side branches for four sessions. As a rule, except the professor, there is no one capable of teaching this branch as it should be taught. In most of our colleges they have demonstrators whose knowledge of the subject is very shallow. Generally they are kept over graduates on a salary ranging from twenty-five to fifty dollars a month, so that it is no wonder that dentists are commencing to look down on this branch as degrading to the profession.

Taking into consideration the lack of proficiency of six-tenths of our graduates of to-day in this branch of dentistry it is not to be wondered at that their failures in the making of gold, porcelain and rubber plates, properly constructed appliances for the correction of irregularities of the teeth, bridges, crowns and numerous other devices disgust them with it and force them to come out and condemn it as a degradation to dentistry.

It is a sorry state of affairs that we have come to this, and the sooner we cease to aim at such a high standing—so high that we are asked to discard the main prop of our calling to attain professional standing—the better, for upon mechanism rests the further claims which we as dentists are seeking to advance.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

DISCUSSION ON PRESIDENT'S ADDRESS.

Dr. C. N. JOHNSON, Chicago: I have been greatly interested in the president's address. It contains many suggestions. One of the points mentioned was as to whether the publication of the proceedings in the dental journals was not a drawback to the membership of the society. Possibly the fact that the proceedings are published in the dental journals may keep some men away from the society; but the aim of all our deliberations here is not for the advancement of the society alone, but for the greatest good to the greatest number, and my impression is that the greatest good is

done by the publication of these proceedings as widely as possible. There may be many men in the profession, in the State and outside of it, who read the proceedings of this society as they appear in the dental journals, but who possibly could not, on account of circumstances, be present at the meetings. I should not like to deprive those men of this privilege. I am therefore in favor of having the proceedings published and widely disseminated.

As to the question of additional membership in the society, I believe that matter will be brought up more pointedly in the paper of Dr. Allen, at which time we can discuss it.

With regard to the formation of fellowship clubs, I favor it heartily. As the president has said, it would be a stimulus to the members of these clubs and induce them to develop the society spirit. The man who becomes identified with a dental society meets members of the profession, gets the society spirit, and is not quite comfortable afterward unless he is a member of societies; and if he belongs to any society he ought to be a member of the State society. We have had a practical demonstration of these fellowship clubs in the formation of the one at Streator, and from present indications it is productive of a great deal of benefit. I commend the organization of such clubs at different points in the State. As to the selfishness among practitioners in these towns, I had a practical illustration within the last week of how perfect the unity of feeling may exist between members of the same profession in the same town.

I attended a meeting of the Kansas State Dental Association a week ago. I had heard a great deal of Kansas which was not to its credit. Of course, you know it is considered the home of the populist. I went there and I must say that some of the best men that ever breathed the free air of the United States are there, and those I talked with are as much ashamed of the populist sentiment as you and I are. I want to say, furthermore, that I have never met a body of men who were so uniformly in sympathy with each other, and under every circumstance extended the right hand of fellowship to each other as they did; and the thing that impressed me most was to see two or three men from the same town congregating and speaking highly of their fellow practitioners. I did not hear one word of envy expressed. I noticed particularly that if one of the members from a certain town read a paper, the other man in the town showed his appreciation of it. The dentists I

met at this society were educated men and as broad in their knowledge as any men I have met in the profession anywhere. I was proud of my profession when I met with this association. The point I started to make was, that even among the dentists in small towns there was harmony of feeling and a lack of envy and narrow mindedness. It was an object lesson. I have met with a great many dentists, but I never met a State society but what at some time or other showed personal jealousy among practitioners in the same town, and it always managed to crop out somewhere. I trust that the formation of fellowship clubs will do away with this feeling. I think that if practitioners come in contact with each other in society work and become better acquainted their respect for each other will be greater.

As to the suggestion of the presentation of a medal or diploma for original investigation, it is a new idea to me, but one worthy of consideration by this society. The young men who are growing up in our profession do not seem to manifest the same tendency toward original investigation that some of the old members do who will soon pass away, and if any method can be devised whereby we can stimulate original investigations it would be a good thing for the State society to do so. It might be well to have a committee appointed to consider this matter. I have no doubt but what some plan can be brought about to encourage our young men to do original work, and it would be a worthy accomplishment.

Dr. D. E. COULSON, Galesburg: I desire to express my appreciation of the president's address. I think we would all do well if we would try to be governed in our daily life by the spirit that was brought out and emphasized in the paper. Dr. Taylor spoke of a tendency toward retrogression in our society, and I think we might perhaps do well to draw a lesson from history with reference to organizations, social and otherwise. The tendency in past ages, when reform seemed to be required, was to destroy the existing organization and to build from its foundation. In this destruction of the organization that had previously existed many good features were always lost and it required some time to regain them in the new. I think that our present rapid advancement along scientific and social lines largely grows out of the continuity of organization. We are indulging in the process of evolving or throwing off the bad and holding on to the good. This should be our effort

and aim in the State organization. We are imperfect as individuals, and consequently we should expect our organization to present the same characteristics; but it is by individual effort, as has been suggested by the president, that we may hope to secure the ideal in our society. As one of the younger members of the society I hope in the future to be able to put in practice in my daily life and conduct with my professional brethren more of this spirit of courtesy, more of this spirit of helpfulness, more of this spirit of lending a hand.

In regard to the colleges and their influence upon the young men. I have talked with quite a number of young men who have recently graduated, and although not saying it directly in so many words, their early association in a college and during their college life was of such a character as not to direct them in the lines that they should follow afterward; but the expression they gave was a lack of honesty in carrying out the spirit of the letter of the law. We cannot put in words the spirit of ethics. It can only be expressed in the living organism, and I think our colleges are appreciating this fact and seeking to improve along these lines, and I for one feel like offering encouragement to them rather than to manifest a spirit of criticism. I trust, therefore, that in the future the society will have no complaint to offer against them.

Dr. ARTHUR G. SMITH, Peoria: There seems to be so much talk of the young men of the Society, hence I cannot refrain from making a few remarks. I do not think we are as black as we are painted. We would like to do right if we could, most of us, and I am pleased to state that Peoria is my native city, and among the dentists in this city there is the broadest spirit of courtesy and liberality manifested. I think, without exception, the young men of this town are endeavoring to the best of their ability to refrain from any questionable practices whatever. A young man came here a year ago and tried to make a start. He conducted himself as courteously and gentlemanly as any one possibly could, but for some reason he was unable to succeed, and rather than resort to questionable practices or to deviate the breadth of a hair from ethical grounds, he discontinued his practice. Nothing could be better than this. The man practically lays down his professional life for what he considers to be the proper thing. In our societies and colleges a young man's professional position is determined largely by the individuality within him. I do not think we can

educate a man who simply wants to make a tooth puller out of himself. There is no use in wasting time on him. He will go as my father said to me when I asked him for advice—"go to h—your own way." I think a man is apt to do that himself anyway, if he is not particularly careful.□ So in regard to the society. The societies are a continuation, so to speak, of the colleges. We are almost bound to get into a rut unless we become members of a society. We read reports, but nonmembers do not receive the benefit that those do, who come to these meetings and listen to the most eminent men, who have given time, study, and attention to the particular subject in hand—men who have spent weeks and oftentimes years in giving us the mature fruit of their investigations. I do not think we do our profession justice if we are not members of this society.

With reference to membership in this society, speaking for myself, I was willing and ready to join this society, but might have gone on until to-day as nobody invited me to become a member until I met Dr. Taylor, who asked whether I was a member of the State society or not. I replied "No." He said, "It is the best thing you can do, and I would advise you to become a member as soon as possible." I thought I was not good enough to join; that I was too small and insignificant, but I got in here and I do not feel very much out of place. (Laughter.) I shall do my utmost to secure as many of the younger men as possible to join this society.

Dr. T. F. HENRY, Streator: We have formed, as our worthy president has said, a professional fellowship club in Streator, and up to within the last month five dentists joined it. Another young man has signified his intention to join. I do not think there is any town in the State that ought to feel more flattered on account of being so well represented as Streator, and this comes through the energy of Dr. Taylor. He spoke to us regarding the benefits of the society, and we were in perfect harmony with him, we thought that if every one would put his shoulder to the wheel and lend a helping hand to every young man that came to our town and began to practice, it would be a great deal better, and the profession would profit by it. Because we are in town and have been located there for some time, as the president has said, we are not "monarchs of all we survey." If that feeling was manifested toward us we would have to go somewhere else and commence to advertise. I found a helping hand, when I began to practice in Streator, in

Dr. Taylor. He welcomed me as he did other dentists. Every dentist that came there we helped along. We had two young men who did not do very well. They saw that the town was overcrowded with dentists and they started to advertise. We talked to these young men and asked them if they would not kindly desist from resorting to such methods.

We extended the right hand of fellowship to them and tried to lead them in the right direction. We asked them to stop advertising and to become members of our societies. The result was that they discontinued advertising and are now getting along nicely. Personally, I feel that there is not a town in the State of Illinois in which there exists more harmony than in Streator. We never pass each other on the street without shaking hands and talking to each other if we have time, and usually about matters pertaining to the profession. I have a warm place in my heart for Dr. Taylor and the rest of the profession, and I believe if everybody in the profession would do as well we would have a much larger membership than we have at present. This can only be done by each one of us helping the other.

Dr. S. FINLEY DUNCAN, Joliet: I think Streator is one of the most resourceful places I ever heard of, and I am glad to know that these young men came in, in the manner spoken of. It is said that one or two young men went to a certain town and did not conduct themselves in a professional way. In other words, they were advertising. One of the older members of the profession said to them, "You must stop that thing or we will put a man close by you to do work for nothing, and then you will have to quit."

Dr. LOUIS OTTOFY, Chicago: I wish to refer to one phase of the president's address, and more especially to the remarks made on that phase by Dr. Johnson, because I shall have something more to say in reference to the matters discussed, when Dr. Allen reads his paper. The question is sometimes raised in regard to the publication of the transactions, it being claimed that a non-member, who is a subscriber to a dental journal, will get the reports of the meeting and read them, while the man who is a member of the society has to wait for his volume of transactions several months; consequently the nonmember is supposed to have the benefit of reading the papers and discussions, while the member who unfortunately was not at the meeting and is not a subscriber to the journal in which the transactions appear, does not

have the benefit. I have no doubt that a number of men are kept from joining the society in that way. On the other hand, there is no dental society in the United States whose papers are so broadly circulated as the papers read before this society. I have seen the papers read here copied from the *DENTAL REVIEW* into dental journals in England, translated into French, Spanish, Italian, Dutch, Swedish, Norwegian, Russian and Japanese.' You may know from this that the value of our papers is appreciated, and that they go abroad to a considerable extent. I think it is the best thing for the society to give the papers as wide a circulation as possible through the medium of dental journals, rather than to have them bound into a volume, put away on library shelves or locked up, only to be referred to on rare occasions.

Dr. EDMUND NOYES, Chicago: It seems to me, there can be no possible question in regard to the publication of the transactions freely. If we were to show any exclusiveness of that sort we would put ourselves as a society immediately back on a level with the traditional old practitioners who were unwilling to take their fellow practitioners or students into their laboratories to show them how they did their work. This is no day and age in which to curtail the circulation of anything that is given in a professional way, no matter what the effect or reaction against our society may be. We should be wholly unselfish as to the effect upon our society. The transactions of everything we do here of value to the profession should be given as wide a circulation as possible for professional purposes.

I wish to say a word or two about fellowship clubs. It seems to me, it is impossible to exaggerate the value and importance of them. There is not a man practicing dentistry who does not to some extent read dental journals and obtain some information in a professional way. There is no place where there are two, three, half a dozen, or twenty men accessible to each other, who would not be benefited by doing this work, in social fellowship. It is unnecessary that they should undertake to do something great or original. Let them come together and talk about the professional things which they have been reading and doing. Two things will come out of it—a broader and more definite professional knowledge, practice and experience, and a far greater propensity to adopt and put into use the new things that they learn and read about than if they simply read about them. If two men talk about a new thing

proposed in some journal article, both of them are more likely to do it than those who read about it and do not talk about it. This is one of the advantages of society meetings as compared with the reading of dental journals. Men are stirred up to do the things they hear about. The other object to be gained is personal knowledge, acquaintance and fellowship, which makes us friends, instead of jealous, isolated, selfish practitioners.

Dr. A. W. HARLAN, Chicago: The president wrote me two or three weeks ago and told me something of the character of his address, and in taking it up, not consecutively, I would like to refer briefly to three or four points that are self-explanatory. He said in the early history of this organization there seemed to have been a greater avidity to read papers and present them—greater enthusiasm in fact. That can very easily be accounted for, because at that time there were no other societies in the State for men to read papers before, and now we have more than twenty societies in the State of Illinois, consequently there is a division of forces, not a division of strength in the papers, because we have just as good papers read before the society now, and better papers than we did in the beginning. We have larger audiences. These audiences have been made by this society. And it does not matter if we only have 160 members, the influence of the society has been so great, so continuous, it has been such a powerful force, that it has accomplished the organization of numerous societies in Chicago and Cook County, as well as elsewhere in the State. It has been the incentive which has led to the development of two dental journals. It has been the force and moving power that has created educational institutions in the State, and it has brought about legislative enactment and the organization of the profession into a body. Can you say that its influence is growing less? It seems to me, it is now in a position, with these better educated, better equipped men, to grow slowly and still further extend its influence.

The president said that there ought to be more original work. Well, perhaps there should be. One of the things, I should say, would be that we had better understand the things that have already been accomplished, encompass them and take them in and thereby educate ourselves, so that some one of our number, or a few of our number, can go further and do original work. I do not consider the function of the State Dental Society at present to be

strictly of a missionary character. What we do now is to keep up the organization and to take in the men and women who are practicing dentistry as they desire to come in, and extend its influence into the organizing of societies in other communities, so that the knowledge we have gained will be disseminated, and if a man or woman does not feel that it is to his or her interest to belong to this society, he must content himself to exert his influence where he lives and thereby benefit the public in that way.

Dr. C. B. ROHLAND, Alton: I do not quite understand the exact scope of some points in the president's address. I would like to ask the apostle of this new idea what he would do in a case of this kind. We have away down in the southern part of our State a practitioner who, in a recent trades procession, had some one mounted on a mule, with a placard announcing that the rider was billed for Dr. ———'s office to have his teeth extracted without pain by the use of odontunder. Is that a legitimate field for the application of this good fellowship idea?

Dr. G. A. McMILLEN, Alton: I would like to say a word or two on the president's address, and in doing so I realize that I am treading upon tender ground. I realize that the position I am taking here is perhaps questionable. I would like to read from this program, if you please, a brief extract. (Here Dr. McMillen read an extract from the program relative to excluding nonmembers from the clinics). Mr. President, this society to my mind, like all other dental societies, is or ought to be a missionary society. I do not believe in excluding any reputable man. I believe that we ought to extend the hand of fellowship instead of shutting such men out. It is the way to build up the society. I have three gentlemen in my mind who are here; two came before the State Board of Examiners; they are practicing in the State now, and they want a permanent license to practice in this State. One of them is from my own town, who is not a member of this society. I said to him this morning, "Are you going to stay until the clinics are over?" "No, we can't go to the clinics." I replied, "You stay and I will see that you do go to the clinics." I do not think the spirit of excluding certain nonmembers is right. I think by permitting nonmembers to attend the clinics we now and then secure a new member. I am sure that I would have secured two members for this society if they had been allowed to attend the clinics. Had I not spoken to one of them to remain he would have gone home to-

day, and we would not have enrolled him as a member of the society. I say this with all due respect to the committee. It is a wrong spirit. I want to add a word regarding Dr. Rohland's story. I know the gentleman he speaks of, and the only addition I have to make is that he rode a *w/ 's* mule.

Dr. GARRETT NEWKIE Chicago: The gentlemen who have preceded me have spoken as well and the remarks made have been so appropriate, that there is very little more to say. I agree with the president almost *in toto*. Dr. Noyes said it was impossible to estimate the value which may accrue not only to dentists in towns and cities who associated themselves together upon the order of this fellowship club in Streator, but to the profession at large and to the State society. I certainly agree him. It seems remarkable that Streator should have been the initiative point of two movements. Fifteen or sixteen years ago there were five or six of us who met in Streator and organized there the first local dental society in the State outside of Chicago, which we named the Central Illinois Dental Society. It is now the First District Society. From this very small beginning, there grew a membership of fifty in a few years. By this movement was also set on foot to organize the northern, eastern and southern portions of the State, the central and western being consolidated, making four large, active bodies of professional men, who have done themselves a vast amount of good, and have been indirectly a great blessing to this society. There is no estimating the amount of good that can be done in this way; and I have always insisted that the major amount of profit was in the friendship, the good will, the professional spirit that is engendered, even more than in the scientific knowledge gained or applied. The professional, brotherly feeling, the kindness, charity, the mutual understanding and all that, is worth a thousand fold more than it costs. Men oftentimes dislike because they do not know one another. We never like a man thoroughly until we understand him and know his good points. Sometimes there is a shell of prejudice seemingly all around and over somebody because he is not really understood. This reminds me of an anecdote, I will say of Smith, Brown and Jones. Smith said to Brown, "I hate Jones." But Brown says, "You do not know Jones." "I know it," he replied, "that is the reason I hate him." This illustrates human nature.

I agree with Dr. Noyes as to the value of the publication of

our society proceedings. There is no telling how much good they have done in their dissemination the world over. We cannot estimate the value of the matter that has gone into print of the proceedings of this society from the day of its first publication until the present time.

There was one thing in the president's address with which I hardly agree. There seemed to be a note of discouragement in the beginning, a certain intimation that the society had retrograded. I do not believe that. The reason this society looks smaller than it used to is this: There are so many other societies. It is no longer the only society. There are four local societies in Chicago alone, and as many more in the State. Occasionally we have clinics in the city which call dentists from all over the United States. We have big things in Chicago in the way of dental meetings, so that the State society no longer stands alone. I believe on the whole the society has progressed and is progressing and is for that reason to be encouraged. There is manifestly a more encouraging outlook to-day, in that we have heard about the young men who are showing a disposition to coöperate in different localities.

Dr. GEO. H. CUSHING, Chicago: I do not wish to consume much time in the discussion of the president's address. It has already been very ably discussed, and I can only say that I agree fully with all that has been said. But I want to call attention briefly to what Dr. McMillen said and ask Dr. Ottofy if he can give us some justification for the action of the council in regard to that matter. Dr. Ottofy is familiar with the grounds upon which that action was taken.

Dr. LOUIS OTTOFY, Chicago: In reply to what Dr. McMillen said, the rule referred to originated in this manner: It has been the custom of a number of gentlemen to attend this society year after year; gentlemen who are practitioners in the State, but not members. They attend the meetings and clinics regularly. I know this, for the reason that I have signed their railroad certificates repeatedly. After I ran across a name for several years I would ask the gentleman why he did not join the society, and he replied that he would join next time. These men have come to our meetings for the purpose principally of attending the clinics, and in this way they have crowded out some of the members. The aim of the council was simply to either get rid of that class of men, or

to give them a gentle hint that they ought to join the society and help to bear some of its burdens, as well as to enjoy its privileges. I would add that the action did not originate with the council, but was the result of a formal, written request of a number of active members, who were prevented from seeing the clinics.

Dr. J. G. REID, Chicago: While I agree in a measure with what Dr. McMillen has said in reference to the item that appears on the program, I believe it is a most excellent thing. We know that a ship has to be freed of its barnacles occasionally, otherwise it would sink. And this little item in the program is going to free us from a few barnacles that have been accumulating on our ship for ten years to my knowledge. These men have done us no good. They come here to get all they can, and give nothing in return. If the supervisor of clinics knows that a certain gentleman or gentlemen come here for the purpose of joining the society they will be admitted to the clinics without any question. I think this action of the council is a good thing. It will be the means of getting rid of a few barnacles anyway, and personally I want to thank the Executive Council for inserting that paragraph excluding nonmembers from attending the clinics.

Dr. E. H. ALLEN, Freeport: Before this item of the exclusion of nonmembers from the clinics is discussed any further or any action taken thereon, I want to say I have an item in my paper that applies to the subject, and I would like to have the society wait until they hear my paper.

Dr. J. W. WASSALL, Chicago: I wish to say a word or two in commendation of the president's address. It will do us all good, in that it will set us to thinking upon matters that will be of benefit to the society and extend its usefulness.

In the matter of the formation of new societies it is interesting to know that the Odontological Society of Chicago last December decided to organize some local dental societies within a radius of one hundred miles of Chicago. The society has already organized three societies, one in Milwaukee, one in Elgin and one in Aurora.

I also wish to say that I do not think this subject ought to be passed without taking some action upon the recommendation of the president that a medal be voted to Dr. Black for the work he has accomplished. Furthermore, I think he made the suggestion that a cash prize be given for original investigation, and I would suggest that a committee be appointed to consider the advisability

of carrying out the president's suggestions. Prizes need not be awarded unless the work is of sufficient value to warrant it. Considering the size of the society, if the dues were all paid promptly we would have abundant funds to be used by the society for purely scientific purposes. If it is in order I would move that a committee be appointed to take this matter into consideration.

Dr. GRAFTON MUNROE, Springfield: I did not arrive in time to hear all of the president's address, but I was very well pleased with what I did hear, and desire to add my commendation to those of others. Reference has been made to excluding nonmembers from attending the clinics. This matter has appealed to me with double force. As you know, I come from a town where our society meets more frequently than any other town in the State, every alternate year, and by reason of that it has been my misfortune or good fortune, as the case may be, to be put on the local committee of arrangements. I have seen a good deal of the comforts and discomforts of attending clinics, and I have also noticed that on several occasions the members of the society were prevented from seeing the work of clinicians on account of the presence of nonmembers. Even in Springfield there are members of the profession who have said to me, "What is the use of becoming members of the State society, we can see all we want." And I think that clause in our program is an admirable one, and if any suggestions are in order, I would suggest that the supervisor of clinics be instructed to look out for nonmembers and exclude them from the clinics every year, no matter where the society meets. Let them become members of the society before permitting them to enjoy these privileges.

Dr. TAYLOR (closing the discussion): I think when you get home and have your printed proceedings of this meeting, you will find that some of the uncomplimentary things, or pessimistic views that some of you think are contained in the president's address is unfounded; that there is only a thin veil, and behind it you will see the good will, the optimism, that the president always has in his heart for this society and for humanity in general, and whatever may have been considered uncomplimentary was put in the address to irritate or prompt some one to say something, and to emphasize what your president did not care particularly to say. I wish to remark that what I had to say in reference to fellowship clubs did not mean for large cities. People who live in a large

city like Chicago do not need these clubs as much as we do in the country. They do not feel the necessity of them. We who live in the country, when there are only five or six dentists perhaps in the town in which we reside, feel it right away when a new dentist comes to town, and yet some of the men who stand the highest in our profession do not always feel so confident when some new man locates in his town or climbs up to the community where the leading men in the city live. This same selfish spirit exists in the city as in the country, and is manifested toward the younger men who attempt to move into the more exclusive communities of city practice or society work. The spirit of what I have said is for city as well as country communities. Fellowship clubs are excellent institutions for small cities. We want to commence at the bottom and reach the top.

Dr. Rohland asked a question. I do not know of a man who needs salvation more than the poor, miserable sort of professional man that rode the donkey or mule to which he referred, and I do not know that any of us should stand so high in professional life that we cannot in some way get down and in touch with that man. I do not believe there is one among us, if we could get the X rays to penetrate our professional ideas of life, but what manifests sometimes an inclination to "ride the donkey," to advertise ourselves to the disadvantage of those who belong to the same profession. What we need is to get into the spirit of this thing, and I do not say that I am more holy than thou. None of us are free from this selfishness, and we should be a little careful in saying that this or that man is much lower than we are. I have in a measure tried to make it pleasant for the young men that came into my town. All the time we say my town, my practice, my home. We are all here not simply to gain a living, not even to live, because the world would go right along if we were all swept out of existence. How few of us realize the loss of the people in the Paris catastrophe. How little do we think of it. We read it, and that is the end of it. If we get the spirit of brotherly love into our hearts and get at the bottom of these things, these young men feel their wants, and if we can reach them, and I believe we can if we are true to ourselves and our community, we can in a measure do away with the jealousy that now exists among dentists. A little more missionary work should be done by this society, and we should do it by genuine living as members. This

is a society that the lower ranks of the profession can look up to as being an organization to which they should belong. We should strive to secure all eligible young men for membership, and we should greet them with open hearts and a friendly spirit. It is my aim to do the best I can for myself and those who come after me; and that is the spirit which should animate us as scientific men, trying to elevate not simply ourselves professionally, but the people with whom we come in contact day by day. (Applause.)

DISCUSSION ON DR. WASSALL'S PAPER.

Dr. A. W. HARLAN, Chicago: This paper of Dr. Wassall deals with a subject that we all have more or less acquaintance with, and I do not expect in opening the discussion to deal with all of the divisions of the subject that he has made. In alluding to the definition, Dr. Wassall states that Wedl had previously described what we know as pyorrhœa alveolaris. He also named it pyorrhœa alveolaris. This book was published about thirty years ago and was translated into English as early as 1872, so that the name pyorrhœa alveolaris had become familiar to a good many English speaking people through reading that translation. Previous to its appearance in English Dr. J. H. P. Brown, of Augusta, Georgia, had described this disease without being acquainted with Wedl's classification or denomination; and it was pretty well known from that description, although no name was given to it. As early as 1877 the late Dr. Rehwinkel of Chillicothe, Ohio, read a paper before the American Dental Association which was devoted to a consideration of what was termed pyorrhœa alveolaris, and later, as Dr. Wassall has said, Dr. Black described one phase of it, one division of it as phagedenic pericementitis. I think probably even now to a mixed audience the distinction between what is known as pyorrhœa alveolaris and phagedenic pericementitis is not clearly understood. I should say from a somewhat close observation of a large number of cases that we find in connection with loosening of teeth not only a detachment of the peridental membrane and wasting of the alveolar process, but another condition present, the development of pockets. In the first case, we have the loosening of the teeth, the wasting of the alveolar process, and a gradual evulsion of the teeth without any deposit whatever, no deposit being found at any time, the teeth coming out clean and divested of the peridental membrane. In the other phase we find that there are pockets and concomitant with them, or shortly following the

development of these pockets we have deposits that have been named serumal or sanguinary deposits. (Ingersoll). Those deposits are granular, or smooth, in sheets or islands, and they may or may not cover the whole side of the root of the tooth as far as the pocket extends along its side. In most of these cases we also have the breaking down of the alveolar process, not symmetrical, but projecting, so that the alveolar process may surround the lingual surface of the tooth and the root, and the alveolar process will be broken down on the labial surface. Now, we have a totally dissimilar condition in that case from the one in which there is a uniform wasting of the socket, with loosening of the tooth and destruction of the periodontal membrane.

In all of the cases of that kind that I have ever seen or examined or observed, I have never yet found one where there was a deposit on the side of the root or near the pockets or covering the apex of the root but what there was some method of reaching it from the gingival margin. I have heard speakers say in conventions before now that these nodules or islands have been found without there being any detachment of the gum at the gingival margin. I have never seen one of these cases. I have seen them, however, when the pulp of the tooth had previously been destroyed, and the root of the tooth had been imperfectly filled, and then I have seen these deposits after the teeth were extracted, but there was no pericemental detachment. If such a condition of things exists whereby a deposit or nodule of calcific matter could be laid on the side of the cementum without any opening leading from the gingival margin, why do we only find such things on one tooth? Why would we not find it on two or three? I cannot answer that question. I do not know. It seems to me that in all of these cases the presence of microorganisms is absolutely necessary, and that we are concerned in the first place with the loosening of teeth and the symmetrical destruction of the alveolar processes with an anærobic microorganism described by Pasteur as early as 1870, I think, and in the formation of deposits on the roots of teeth, in pockets or pouches, that we are concerned with the anærobic and the facultative microorganisms, the anærobic microorganisms being able to subsist and destroy tissues without the absolute presence of oxygen, and the facultative organism working as a pathogenic microorganism that subsists in the presence of or being deprived of oxygen. These minute deposits

and granules and sheets, I should say, are probably, without knowing anything more definite, the result of the destruction of the hard tissues surrounding the root and the deposition at that point, because the roots which contain the products of these organisms are not exposed to any of the fluids sufficient to wash them away, and so in these deposits we find there remains the old and broken down facultative and anærobic organisms. This is very clearly shown by some of the work of McFarland in his book on "Pathogenic Bacteria," and it is further shown in the work of Park in the American Text-book of Surgery on the "Deposits on Long and Flat Bones," but always where there is an open sinus or an opening to the external world. By analogy, if the same process causing the destruction of a portion of the periosteum in bones and the destruction of a portion of the bone itself, or a destruction of the nutritive material which is carried to the point which is loaded with inorganic materials, probably we have reason to believe that that may be the method of the deposition of these deposits independently of the uric acid, rheumatic, gouty, or other diatheses.

Dr. Wassall in his paper said that he did not quite wholly subscribe to the theory of Pierce and Kirk with reference to all of these cases being attributed to the uric acid diathesis. It has been my good fortune to have had under my care a few people who were strict vegetarians, and it is not generally believed that vegetarians are subjects of the uric acid diathesis, but they had loosening of the teeth and so-called or actual pyorrhœa alveolaris. It does not seem to me that the theory of the universal production of nodular deposits on the roots of teeth is wholly accounted for by the theory advanced by Pierce and Kirk, as the whole human race can hardly be said to possess a universally rheumatic or uric acid diathesis. I know we are sailing in deep water when we are talking about the deposition of these islands and granules and nodules on the roots of teeth, but we have them present, and if we can prevent injury to the gingival margin, the gingival attachment to the necks of teeth might perhaps solve that question. But we have an actual loosening of the teeth, and we have to meet that condition of things.

The method of administering medicines internally for the cure of what we term pyorrhœa alveolaris without surgical treatment or removal of the deposits is an absolute failure. The deposits must

be removed. The administration of various forms of lithia and lithiates and gaseous waters for the relief of the loosening of teeth, where there are no deposits, does not result in a cure. It has been absolutely necessary to fix these teeth with splints or bands or some method of holding them together by running bars across the ends or wires, or something of that sort, and the application of local remedial agents.

In the consideration of the causes of pyorrhœa alveolaris, in a paper read by Dr. Rhein, of New York, a year and a half ago, he attributes everything practically to malnutrition; but you and I know, and nearly everybody knows that some of the most robust and active and outdoor people have loosening of the teeth. They may have nasal obstructions; they may have diseases of the mucous membrane itself which will cause them to breathe through the mouth. Now, in those cases we have true pyorrhœa alveolaris, that is to say, as distinguished from phagedenic pericementitis, with the destruction of the alveolar process, of the periodontal membrane, loosening of the teeth, distortion of the teeth, etc., without any uric acid diathesis or complications. I should say, then, pyorrhœa alveolaris with a half a dozen other names, such as infectious alveolitis (Witzel), and loculosis alveolaris (Farrar), symptomatic alveolar arthritis (Magitot and Malassez), subscribed to by Gallipe, of Paris, who has paid a great deal of attention to this subject, with all of these various aspects, we have a great variety of complications, all of which need more or less different terms, and so far as I am concerned, I have never been able to follow a cast iron rule in the treatment of these cases.

There are two points in connection with pyorrhœa alveolaris that I would like to emphasize, as spoken of in Dr. Wassall's paper. They are these: One is this, that the teeth must be fixed in their sockets, held as nearly firm as it is possible to hold them, permitting of a minimum movement. The other point is that the deposits on the roots of teeth in pockets and pouches must be removed. When that is done, cleanliness, the frequent use of various agents in the mouth to destroy any infection, and the sufficiently frequent use of systematic medication to the pouches or pockets is all we can do to effect a cure.

With reference to recurrence. It seems to me there are a number of cases that are cured, and they do not recur. This

depends entirely on the local cleanliness and care, with a reasonable amount of inspection by the dentist.

Dr. R. N. LAWRENCE, Lincoln: I have no criticisms whatever to make on Dr. Wassall's paper. He has given us a clear, concise résumé of the outlines of this disease. So far as my experience with the disease is concerned I have had many successes and some failures, but I feel very much encouraged. We know very little about the etiology of this trouble, and there is an extensive field that lies before the young men of our profession along this line.

So far as bacterial conditions are concerned, bacterial pathology is a subject which should stimulate our young men to investigate and to make some experiments, in order that we may come to a conclusion as to the cause of the different varieties of pyorrhœa alveolaris. It is evident to my mind that there are varieties of the disease which produce the same results, a destruction of both hard and soft tissues.

Coming to the treatment, so far as my experience goes it is a surgical disease, and it requires a knowledge of the parts and the skillful use of proper instruments to remove the deposits that may be in the pockets or about the teeth; in other words, we should make a clean surgical wound of the pocket and surroundings, being thoroughly aseptic in our treatment, and invite nature to bring about the formation of new tissue. Whatever that tissue may be I am not prepared to say. But I know from results which I have seen that such tissue is formed, the teeth grow firm, the surrounding parts become healthy, and the patient is made comfortable. Perfect rest, cleanliness and stimulation of the parts must be maintained, or there will be more or less trouble. The case will require careful looking after.

As to the uric acid diathesis, I have read with a great deal of interest what some of our eastern practitioners have had to say in reference to this matter; and while Dr. Black says that there may be some uric acid deposits in these pockets, I do not think such deposit is the sole cause of pyorrhœa alveolaris. I had one case which, after treatment, I dismissed about a year ago. It was one of the worst cases of rheumatic gout that I have ever seen, where the articulation of the thumb and finger joints was almost destroyed. Under the use of lithia waters the patient has been made comparatively comfortable; having lost no teeth, and having no decayed teeth. This was a case of pyorrhœa alveolaris which ex-

tended over the entire mouth, but which involved more particularly the molars. On examination of the case the first time, I found the gums everted and thickened. I could pass a probe almost to the apex of the roots of the molar teeth. I saw the patient the other day, and outside of some ordinary calcific deposits on the lower front teeth, I found no pyorrhœa. I took a fine probe, and passing it around the necks of the teeth I found the pockets closed. To-day there exists simply a dimple in the gums where the pockets were.

With regard to systemic conditions in these cases, I invariably consult the family physician; and I find in females with female troubles, especially where there is leucorrhœa, that unless this condition is controlled we shall fail to cure the pyorrhœa alveolaris. The systemic causes must be overcome, and the dentist must act in conjunction with the family physician. Take a large percentage of the cases where there are several pockets, and by thorough instrumentation and the use of lactic acid to produce adhesive stimulation, being careful to maintain thorough asepsis in your operations from start to finish, you can effect a cure in most of them. One of the essential points in the treatment of pyorrhœa alveolaris, as in any surgical operation, is to be absolutely clean. Your instruments should be kept in a solution of sulpho-naphthol during the operation, and thorough cleanliness should be maintained by washes after treatment. Take many of the cases that come to us from the country—people who do not care as well for their mouths as those who live in cities. It is my invariable custom to resort to a system of massage; that is, where the gums are swollen and tumefied. After getting through with the surgical part of my work, I pinch these gums as hard as I can to relieve engorgement before making the final applications. Having done this, the pockets can be sealed up by the use of lactic acid. If, on reëxamination of cases treated, I find a pocket not closed, I conclude that there must be some remaining deposits and I proceed to remove them with instruments, or a 5 per cent solution of trichloroacetic acid, as suggested by Dr. Harlan, which will act as a solvent in such cases. Having removed the deposits and all dead tissue, soft or hard, close up the cavities and give nature a chance to do the rest of the work.

I followed Dr. Harlan's advice with regard to treatment of recession of the gums with iodide of zinc, and it has surprised me

what success I have had. By making vertical and horizontal incisions and cauterizing the gum with iodide of zinc, the V space can be reduced one-half at least.

I do not rely upon lactic acid to remove deposits, but upon Dr. Younger's improved forms of instruments, to be used by me in my clinic before this society in demonstration of his successful treatment of pyorrhœa alveolaris.

Dr. THOMAS L. GILMER, Chicago: I have been very much interested in Dr. Wassall's paper. He has covered practically all the points regarding our knowledge of this disease. I wish to relate in this connection an incident: About twenty-six years ago Dr. Chase, of St. Louis, was the professor of operative dentistry at the Missouri Dental College, where I was attending lectures. At that time this disease was not understood or discussed as scientifically and thoroughly as it now is. It was more frequently spoken of as tumefied gums. Dr. Chase was a homœopath. He told the students that if we would use very small doses of calmel, or, as he called it, *mercurius vivus*, we would get beneficial results in the treatment of this disease. I afterward used it to some extent and did seem to get benefit from it, but finally discarded it. About a year ago one of my patients, who had pyorrhœa alveolaris, disappeared. Seemingly I could only alleviate the condition in her case by the ordinary treatment. She is a sort of semi-invalid, and is frequently in the hands of one of the most eminent physicians in Chicago. Two or three months ago she returned. I supposed, unless she had had treatment by some one else that her teeth would be loose or lost, but was surprised to see the condition of her gums when she assured me that she had seen no other dentist. The diseased condition had largely disappeared. There were some serumal deposits, still the gums looked healthy and were hugging up around the teeth closely. I asked her what she had been doing for her teeth, and she replied, nothing, but that her doctor had treated her for some other ailment on very minute doses of calomel. This she had taken for several months. Of course, I do not know that the calomel had anything to do with the cure of her gums. I saw the condition her teeth were in then and the condition they are in now.

Dr. CUSHING: Was this homœopathic calomel or ordinary calomel?

Dr. GILMER: I believe she was receiving one-twentieth of a

grain of the calomel treatment daily. Of course, physicians recognize now that three pellets of the twentieth of a grain of calomel is ample to stimulate the liver.

Since so much has been said about the rheumatic diathesis being the cause of pyorrhœa alveolaris, I have watched my patients who have had this disease very closely, and it is the rarest thing for them to acknowledge ever having had rheumatism. On the other hand, I have found that rheumatic patients generally have a good deal of erosion of the teeth, particularly of the occlusal surfaces.

I think Dr. Lawrence is correct in his statement that it requires surgical treatment in order to effect a cure in pyorrhœa alveolaris. If we immobilize the loose teeth and remove all of the deposits, and all of the carious portion of the alveolar border, we are very likely, without any other treatment, excepting perhaps the use of a detergent, to effect a cure. I have in some instances omitted stimulants in the treatment of the disease, relying on surgical procedure and thorough irrigation, and find I get as good results as when I have used stimulants. Surgeons often by curetting the walls of a cyst, stimulate new and healthy tissue and cause a cure. We do the same in the treatment of pyorrhœa. I think small flame shaped burs are very useful in removing deposits.

Dr J. G. REID, Chicago: I know very little about this subject, and wish simply to relate an incident which Dr. Gilmer has touched upon, and which makes me think that this is one of the most difficult troubles we have to contend with. We listen and think, and it seems to me it is nothing but think, think, think, and when we have gotten through thinking, the case is done with. The case I have to relate is one that has given me more trouble than any case I have ever had. It was similar to the one related by Dr. Gilmer. A man had pyorrhœa alveolaris whose hair was falling out. The teeth were getting loose. He was a young man, comparatively speaking, but he had lost, through my scrupulous care, two or three molars, and he became so debilitated that he had to quit business and put himself under the care of a physician—a homœopathic physician. I saw the gentleman two years later and expected to see him with his teeth missing, but when he came into my office the teeth that were left were in a healthy condition. This was one of the most aggravated cases of pyorrhœa alveolaris that I have ever come in contact with. I asked the patient if he could

relate to me the treatment he had undergone. He could not tell anything about it. He said he had faithfully and conscientiously followed the advice of his old homœopathic physician; that the physician kept his pockets full of small pills, which were to be taken as advised. This he had done for two years. When I saw the man's mouth at the end of this time there was absolutely no indication of pyorrhea in any part of his mouth, and his teeth had not been touched by a dentist in the meantime.

Dr. CUSHING: Did you consult the physician regarding the matter?

Dr. REID: I consulted the physician, but he would not tell me anything about it. He told me I would have to study medicine and find out what he had. I cannot account for the cure of the pyorrhœa in this case. I do not know whether it was the physician or not that brought about this result. The man was reasonably clean about his mouth and took the best care of his teeth he could. It seems to me remarkable that such a condition was brought about in this case. I have no theories to offer as to the etiology of pyorrhœa alveolaris. We find this condition existing in rheumatic and gouty people, and the gouty and rheumatic people who do not have it are just as numerous as those who do have it, and personally I cannot advance any definite opinion as to the cause of this disease, and I can only say that I do not think we know very much about it at present. Some cases we can and do cure, and there are a great many cases in which we do not effect a cure. I have been tempted oftentimes to experiment a little in some apparently hopeless cases by removing, scraping and replanting them.

Dr. GRAFTON MUNROE, Springfield: In my practice of twelve years I have met with a number of cases of pyorrhœa alveolaris, but I very rarely make any promises to my patients as to what I can do for them. Dr. Wassall has suggested that patients with this disease ought to call on the dentist every three months, and I believe this is one of the keynotes to successful treatment of these cases. I have been discouraged to find that some of my patients did not come back at the end of three months for additional treatment, if necessary. I have found one case that relates especially to this trouble which I desire to recite. A gentleman, who lives in Springfield and conducts a business there, thought he had struck a cure for this trouble, so much so that he

wanted me to tell it to other people, and it is along the line of homœopathy. He had traveled all the way from Montreal to California, visited dentist after dentist, and when he asked the dentists whether they could do anything for his trouble; they would shake their head and say the disease was incurable. He found one man that was willing to treat his teeth, and another man in Bozeman, Mont., who had obtained medicine equivalent to Robinson's remedy, which we have often used for this trouble. He persuaded me to send for that remedy. I had used it quite often without any marked results. However I secured it to please him. After some visits to different dentists he came back to me and had me to help him a little. He then told me that he was taking a homœopathic remedy by the name of *calcareo renalis* internally, and that he had been taking it constantly for some time. Under the use of this remedy and the attention that he received at my office and from other dentists he happened to visit in the country, he improved considerably, and thought that *calcareo renalis* was such a wonderful remedy that it ought to be proclaimed to the world.

Dr. GARRETT NEWKIRK, Chicago: There are two or three points I wish to touch upon in connection with this subject. We have heard a good deal about the etiology of this disease to-day, and we know not very much more than we did before, although the paper is an excellent one and presents the facts up to date. A good deal has been said with regard to the removal of the deposits from the roots of teeth. Very well and good, but we must not forget that after the disease has reached a certain stage and there are present large pockets, we have not only to remove deposits from the teeth, but we have to contend with carious bone, real caries of the alveolar process. Dr. Gilmer has touched upon the subject when he spoke of burs for scraping, but I wish to bring it out clearly and emphatically. It is necessary to examine the condition of the alveolar process in these cases, and find out whether or not there are any *spiculæ* of bone extending into the pockets, because there is often an irregular, ragged condition of these walls. We will find by using a scraper, or a spoon shaped excavator of the large sort, or a bur, with or without the engine hand piece, that the walls will break down easily. We should use a bur or other instrument till we feel that we have got down to the harder tissue of the alveolar process. We must get rid of the loose ragged walls. I have had many cases where, after removing

the spiculæ of bone that reached in between the teeth, the walls being thin, a cure has been effected almost spontaneously with very little other treatment.

A few weeks ago, when I started for California, I gave final treatment in a case of this sort that had been obstinate for a year or more. By means of the bur I reached around in between the roots of the two central incisors, found the softened and easily removable pieces of bone, which I thoroughly took out. Then my assistant during my absence made two or three injections, and when I came home the case was absolutely cured. The gums were in a perfectly healthy condition. It is just as important to examine the bone as it is to examine the tooth.

One more point. Where you have a case, for instance, involving the lower incisors and possibly the cuspids with them, and there is, perhaps, a crowded overlapping condition of the teeth, extract the worst one of the lot for drainage, then bring the others together with ligatures. You may effect a cure in this manner often when you cannot do it in any other way. If you have a lower incisor or bicuspid which is just hanging by the end of the root, it is better I believe to have it out of the way, to relieve congestion, secure drainage, give room for treatment, and save the rest of them.

Dr. F. H. McINTOSH, Bloomington: I cannot say how intensely interested I am in this subject, and perhaps my method of treatment will help some one, and so I will tell you the method I employ in the treatment of these cases in the way of medicaments. I syringe out the pockets, each of them, with a 3 per cent solution of pyrozone, and following that I use a 10 to 15 per cent solution of aromatic sulphuric acid. I get excellent results from this method. Most of you understand the action of aromatic sulphuric acid. It takes hold and removes dead portions of bone, and does not affect the living.

Dr. J. G. TEMPLETON, Pittsburg: Like some of the other gentlemen who have spoken on this subject, I must confess that I know very little about it. I have been treating cases of pyorrhœa alveolaris since 1867, at a time before Riggs wrote anything on the subject. At that time I could get nothing to read on the subject, except what was in "Tafts' Operative Dentistry" and what was written by the older men of the profession. There was a little in Harris' work, but not very much. When Dr. Robbins, of Marys-

ville, found out what I was doing he laughed at me. He said he had been all through this thing and I would have to quit too. I remember saying to him that I did not expect to quit, but that I was going to keep on trying to find something to cure this disease. I asked everybody for information and got nothing. The first I saw was Riggs' work. I did not like it. I had an experience prior to that time not to like what he wrote, when he recommended tincture of myrrh. All I did know was to remove the deposits with such suitable instruments as I could get, and I have in my possession now for removing deposits of tartar, instruments that were made fifty years ago. The man who owned them was killed at the battle of Fredericksburg. I got them from his son and I have used them up to this day. He had been practicing some twenty-five years before he entered the army. As Dr. Reid said, we do not know very much about pyorrhœa alveolaris—as least, I do not, although I have been studying it all this time. I believe I have read almost everything that has been published on the subject, and have received some hints from what Dr. Harlan has written, and some points from what Dr. Peirce has written. I do not place much confidence in the uric acid theory. A few years ago, Dr. Patterson took the ground that pyorrhœa was due largely to catarrh. In a person who has catarrh badly, this trouble is likely to be aggravated, just as a uric acid diathesis will aggravate it. The best thing in my opinion that has been written on this subject in the way of illustration and description, as has been mentioned here, can be found in the "American System of Dentistry," in the article written by Dr. G. V. Black.

In regard to the treatment of pyorrhœa alveolaris. I have practically gone through the materia medica in search of remedies to cure this disease. I have tried everything that has been recommended, and I always get back to one thing. Dr. Peck will recollect that I treated some cases at the Chicago College of Dental Surgery a few years ago, and I have to say this in regard to these cases, that there is a great deal called pyorrhœa that is not pyorrhœa. Dr. Black makes an accurate distinction between cases when he says that certain cases are nothing more nor less than calcic inflammation.

It is an inflammation of the gums caused by the deposit of tartar around the necks of teeth producing irritation. It is different from genuine pyorrhœa. Pyorrhœa means a flow of pus from

the sockets, from the alveolus, and when you see a genuine case of pyorrhœa alveolaris you do not see much deposit. The pus flow is dissolved, it is not oozing out, and there may be some deposits upon the roots of the teeth. It has been said by Dr. Lawrence, and very properly, that we may remove all the deposits. I think that is the first thing we should do. If you use the proper instrument and have an educated touch to your finger, you will know when it comes in contact with any of these deposits. Sometimes it requires considerable force to dislodge them.

A few words more in regard to treatment and I have done. I was invited to read a paper before this society, and have prepared one on practical things in practice. At the time I did not know there was to be a paper read on this subject. I have prepared a few lines in regard to pyorrhœa alveolaris, and I shall be glad to tell you something about it to-morrow when I read the paper. I will simply say that my sheet anchor in the treatment of pyorrhœa alveolaris is sulphate of copper. Dr. McIntosh referred to the use of aromatic sulphuric acid; that comes nearer to my treatment than anything that has been mentioned this afternoon. You all know that where there is necrosis of bone the sulphuric acid treatment is the most reliable, and that you have to depend upon it to arrest necrosis. I applied it heroically in many cases. I learned to use it at the Pennsylvania Hospital in Philadelphia. While there I saw many cases brought into the clinic presenting large ulcers on the limbs and different parts of the body. These ulcers were indolent and would not heal. We applied a 20 per cent solution of sulphate of copper on a cloth saturated with it, which was laid over the ulcer, and the next time we saw the patient we could see that the ulcer was beginning to heal, that granulations were taking place. At the end of a few weeks the ulcer was entirely healed. After seeing it used in the Pennsylvania Hospital for the treatment of ulcers, I thought of these spongy gums that I had been trying to cure. When I reached home, in the first case that came to my office I thought of this treatment of 20 per cent solution of sulphate of copper. I applied it and had excellent results.

Dr. WASSALL: There is very little for me to say in closing the discussion on my paper. There does not seem to have been any criticism upon it. The discussion, however, has been so instructive and interesting, that I think those of us who heard it have been

benefited, and I am glad I selected the subject of pyorrhœa alveolaris for my paper.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

Regular meeting held April 12, 1897, Dr. Geo. B. Perry in the Chair.

Dr. F. B. Noyes read a paper entitled "The Structure of the Peridental Membrane."

DISCUSSION.

Dr. D. M. Cattell: The writer of the paper intimates that what he has written is a review of previous studies of this membrane, but it is more than that. There have been a number of hints thrown out and thoughts brought up that were not discussed in Professor Black's earlier work, that the paper refers to. The gathering together of these little items or points of knowledge, so arranging and placing them before us in systematic order, presents the matter to us in a manner that is easily understood—at least, makes it very interesting; while a longer course of study and going into the more minute details of the subject would require longer time and closer study. The pictures that he presents here before us certainly help out wonderfully to our lesser understanding; they have been object lessons without which it would be difficult for us to gather the full sense or meaning of much that he has given in the paper.

There was an idea presented and reiterated again in the final synopsis of the functions, and so on of the different cells of the membrane, describing the cementoblast and the osteoblast, then the osteoclast, or tearing down cell, giving to the osteoclast the property of tearing down cementum as well as bone. That idea is new to me. I had supposed that only a cementoblast could build cementum, an osteoblast build bone, and odontoblast build dentine, and that the *clasts* were in exactly the same order; for instance, that Italians were not allowed to tear down what another nation had built up, yet I might be mistaken.

He spoke also of the glandular cells of this membrane, stating that Professor Black was the only one that had described them, which, as I understand, is true; but others have recognized them since being brought to their notice, not at first, however. Some years ago, when Professor Black first described them, there

were criticisms from the pens of eminent histologists, and I think it is only two years ago when a recognized histologist, Dr. Sudduth, and he were conversing on the subject, Dr. Sudduth not believing in such glands. Professor Black, however, showed them to him most distinctly under the microscope, and he then claimed that he did see them, and that they were there, and that the representations presented under the microscope of the specimens shown by Professor Black exhibited them beyond any question, and gave up all his previous ideas of the matter, and conceded that there were such glands, and since then I have heard him speak of them as well.

I believe it is thought that the functions of these glands are not yet fully understood. I do not know of anyone that has given them much special study beyond what Prof. Black has done, and I do not think he has studied them much within the last three or four years. That is, he has not experimented, or has not produced specimens on a line of study that would tend to bring out that function.

Another thought was brought out in his representations of the bony structure around the wall of the alveolus, showing the large canals of the Haversian systems, situated about the foot; where in case of an alveolar abscess the enlargement of the pus sac, as it is called, and presenting in time a tube-like opening and passing almost directly out from the abscess to the surface of the bone, following the course probably of one of the larger Haversian canals.

Dr. NOYES: There is very little I have to say in closing the discussion. Only one point that was brought out by Dr. Cattell I would like to speak of and that is in regard to the osteoclasts and cementoclasts. The osteoblasts and cementoblasts are classified not only by their function but by their form—their morphology. There is a great difference between the form of the osteoblasts and the form of the cementoblasts. The osteoblasts are always cuboidal cells; never, or almost never, are they flattened in their nature. The cementoblasts are always flattened and scale-like in their nature. The reason I make no distinction between osteoclasts and cementoclasts is that you can determine no morphological difference. If I were to show under a microscope a cell in a hollow of the cementum, absorbing away the cementum, so that you could not see the cementum, so that the view was limited to the cell which was destroying the tissue, and under another micro-

scope with the same power should place a cell which was destroying the bone so that you could not see the bone, could only see the cell, I think no one would be able to tell which was cementoclast and which was osteoclast. For that reason there is no distinction made between them, and we say that the osteoclasts are the cells which destroy calcified tissue, whether it be bone or cementum or dentine or enamel, for that matter.

Dr. CATTELL: Could you use properly the word osteoclast for the function of tearing down some other tissue besides bone? Would the word *osteo* be proper?

Dr. NOYES: Well, in a certain sense it would not; that is, perhaps it would be better to give them some name aside from either bone or cementum or dentine.

Dr. CATTELL: Is not the word cementoclast very often used?

Dr. NOYES: Yes, it certainly is; it occurs in the literature very often. It is used to define the cell in regard to its function and it is a legitimate term of course. But I have not used the term and have not adopted it because the cells are morphologically the same, and the probabilities are that their origin is the same, and the only difference is that in one case they happen to lie against the cementum and are dissolving away that tissue, while in another case they are lying against bone and dissolving away that tissue. The question comes in here, if, for instance, you had the cementum and the bone in contact, so that this one cell could dissolve through the cementum and come to the bone, would it not eat out the bone just the same as the cementum? There is no reason to doubt but that it would. To use the same simile that Dr. Cattell used, the Italian can tear down the German's work. It has been done in history often enough.

Dr. CATTELL: If that be true cannot the German tear down the Italian's work?

Dr. NOYES: Certainly.

Dr. CATTELL: Then why would you use the term osteoclast so exclusively and give no room for another name on account of the work it was doing?

Dr. NOYES: I would not exclude the other term, and the only reason for adopting the one is that the term osteoclast is the older term and it fills the bill. I have, of course, no objection to the term cementoclast, it is a perfectly legitimate term: it locates the cells; it defines the cells in the terms of their function, but the

reason I have not used it is because morphologically the cells are identical.

A MEMBER: Could you with the microscope distinguish the two cells, the osteoclast and the cementoclast?

Dr. NOYES: No, I have not been able to distinguish them. That is, as I say, if you had a cell dissolving cementum in the tooth, so that you cannot see the cementum, you could not tell that from one which was dissolving the bone, from anything in its structure.

If the members of the society care to look through the instruments, I have arranged there six specimens of the peridental membrane. The one under the first instrument is under a power of fifty to sixty diameters. I think it has an inch and a half objective, and is the section that this drawing is made from. The instrument next to it has a much higher power, and shows simply the fibers springing from the cementum. The other instruments are of powers from one to two hundred diameters, showing cross sections through the tooth and alveolus and peridental membrane.

INCIDENTS OF OFFICE PRACTICE.

Dr. D. M. CATTELL: This is an "incident," but I have it yet to perform, and I want some help. I placed an upper bridge the other day, one pier being a cuspid with a porcelain face, the other pier being the second molar—a sound tooth. The pulp was devitalized and removed, canals filled, the crown cut down and the shell made in such a manner that it fits the crown almost exactly, so that in slipping it on and removing it, before assembling with its fellows, was a difficult thing to do. The position of the roots of the two piers were such that made it very difficult to remove the bridge after once being placed in position before cementation. The cuspid root has a large canal, and in it I fitted a platinum pin almost to the apex. The bridge had been worn for two weeks, and came in, to my utter discomfort, with the porcelain face broken away on a line parallel with the surface of the pin heads. How am I to get that off? Need I take it off to get another porcelain face on? The backing is thin. If any one can help me out, so I will not have to tear that bridge all to pieces, make it over again and replace it, or so I can fasten a porcelain face on and not have a bunch on the lingual surface, I would be exceedingly thankful.

Dr. NOYES: I would like to ask Dr. Cattell how long that backing is. Is there considerable space in the backing above the root?

Dr. CATTELL. It is a cross pin tooth of rather short cusp. The backing came down and just tipped the incisal edge. I do not think the break was on account of chewing or pressure, but a fault in the tooth, probably aggravated a little in the heating; at least that is the only way I can account for it. It did not show any cracks on the surface after it was done; at least, I did not see any. It is the same cracking that was spoken of by an Eastern gentleman—I think, an Englishman—in one of our dental journals some few months ago.

Adjourned.

CLINIC REPORT.

REPORT OF PYORRHEA TEST CASES, SHOWN BY GEORGE V. I. BROWN, D. D. S.,
M. D., C. M., DULUTH, MINN., ANNIVERSARY CLINIC, CHICAGO, ILL.

Operated upon by C. H. Rosenthal, D. D. S., Cincinnati, O.; Charles P. Pruyn, M. D., D. D. S., Chicago, Ill.; William T. Reeves, D. D. S., Chicago, Ill., and Arthur B. Freeman, M. D., D. D. S., Chicago, Ill.

Having in mind the difficulty of arriving at definite conclusions from discussions and papers concerning the treatment of pyorrhœa alveolaris by different methods given, because of the impossibility of ascertaining just how perfectly or imperfectly, as might be, the removal of calcarious deposits upon the roots of teeth had been accomplished, it was determined, if possible, to prove the exact results of various methods.

To this end models were prepared of teeth which had been lost through this disease, surrounded by a flexible rubber imitation of the natural gum, so prepared that though very well hidden from view an exploring instrument could definitely locate and outline the pockets after the whole had been encased in plaster, which represented the bony unyielding matrix in the mouth, and though criticised by some, those who operated unanimously agreed that it made a very good representation of the conditions as we find them in the mouth, so far as the difficulty of the cleansing operation is concerned.

Through the kindly assistance of the above named gentlemen, who gave their coöperation, these pockets were treated by several methods and afterward, the plaster casing being broken away, the exact result was easily disclosed, as will be seen by the photographs showing the cases which had been definitely reported and returned for inspection (many others not having been returned).

Upon number one was used sodium chloride, with an electric current; this case gave a fair result in direct line between the two points of application, but as to the entire surface seems to be unsatisfactory. Whether the difficulty of handling such a model



FIG. 1.

FIG. 2.

FIG. 3.

was the cause, or whether this difficulty would also exist in the mouth is, of course, a matter for discussion.

The current was probably much stronger than could be used in the mouth with safety.

Numbers two, three, four and five were cleaned by the use of



FIG. 4.

instruments alone, and certainly reflect great credit upon the skill of the operators, particularly number three, which was an incisor, with pockets extending all around and covered with tough, thickened membrane, saturated with pus and mucus, an extremely difficult case, as were also numbers four and five, which had de-

posits between the roots at the point of bifurcation, upon the surfaces shown.

All of the operators agreed that such labor as was required to

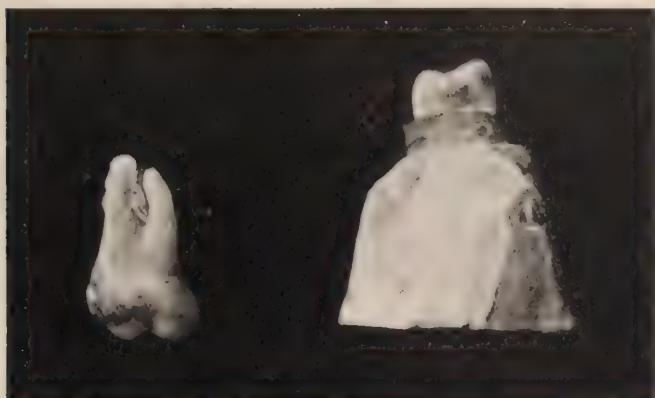


FIG. 5.

do this work, such an amount of electric current and force in the use of instruments would be out of the question in dealing with cases in the mouth, so that a fair presumption is that the majority



FIG. 6.

of the cases, even in most skillful hands, are but imperfectly cleansed.

It is worthy of notice that having removed all of the calculus, all of the periosteum was also removed; the tracks of the instru-

ments are plainly noticeable in the picture, especially number four which was slightly magnified to show them plainly, and the questions would seem to face us for consideration are whether we will moderate our efforts to perfectly remove all deposits; whether we will try to preserve a root after having removed all its membranous covering and destroyed its last hope of nourishment, or as is quite probably the case, we must depend upon the use of some medicament which will dissolve remaining deposits without injury to healthy portions of the membrane after we have removed as much of the deposit as may be done with instruments with an amount of scraping sufficient to excite healthy granulations and renew vitality without destroying the tissues upon which life depends.

The conclusions indicated as a result of the above experiments would certainly seem to warrant the last given as the most rational method of procedure.

ST. LOUIS DENTAL SOCIETY.

DISCUSSION OF DR. BARTLETT'S PAPER.

Dr. PROSSER: We have heard an admirable paper, and the doctor has struck the keynote in a good many things. I think there is no question that careful mechanical dentistry is needed, and I agree with him in regard to fitting mouths for plate work and doing it yourself; for while I have not done mechanical work for some time, I have always found that where you do the work yourself you give better satisfaction than where you have given it to a mechanical man. Where you have a man under your charge and can instruct him just how you want the plate made, of course you get better satisfaction. But in all cases where you trust it to the mechanical man, though he may make a first-class plate, owing to the fact that he has not seen the mouth, the chances are your plate would not be as satisfactory to you or your patient as it would be if you had directed the man and had him under your supervision.

Dr. CHISHOLM: A mechanical dentist is an operative dentist. A man to be a good operator must be a good mechanic. He must understand anatomy, chemistry, metallurgy, something of articulation and mechanics, and all those departments have to be studied. In order to anchor a filling properly he must understand

the use of the wedge, beveling on all facings and points of the teeth, and it seems to me that the one includes the other, as Dr. Bartlett says. I agree with Dr. Bartlett, admire his paper very much, and think it is to the point.

Dr. KENNERLY: I want to compliment Dr. Bartlett on his paper, as I am well aware of the fact that he as well as myself are cranky on the subject of prosthetic dentistry.

However, I want to take issue with him on one point, and that is, the colleges. I want to tell the doctor one or two little things that have taken place, or rather, improvements in the methods of teaching in the last few years since the doctor quit teaching. One of them is, that the schools employ a man by the day to sit in the laboratory with a rubber apron over him for the students to take impressions of his mouth, as they did not do when the doctor was a teacher.

There are schools that are trying as honestly and conscientiously to turn out capable men as graduates as could be wished. But the fact is, that from the time a student first puts in a gold filling he never wants to give any more time to plate work. Like medical students, all want to be surgeons, and how few ever reach any prominence in their work. So it is with the dental student; as soon as he has once put in a gold filling all thoughts of plate work have vanished from his mind, and where I have the clash with my students is in this. They have to make fifteen plates during the three years. I am determined that my students shall have some idea of prosthetic dentistry, and they have to make five plates each year of the three years' course. So I think that by that time they ought to have a pretty good idea of it; at least, as good as I had when I started out.

Dr. MANHARD: While I agree with Dr. Bartlett and don't think for a moment that prosthetic dentistry should be left out of a dentist's practice at all—I don't presume to be well up in mechanical work; I do all I can, a little on the outside—I think that mechanical dentistry is carried as well into operative work as in plate work or crown work.

As Dr. Chisholm has stated, in order to properly prepare a cavity and anchor a filling you have got to understand mechanics, so that your filling will be held in the tooth by the shape and not depend upon cement, and such articles as we frequently see in journals, to hold the fillings.

Dr. CONRAD: I am glad you have not forgotten me. I could have told you that a paper from Dr. Bartlett would be a good one.

I think if students made more plates they would be better dentists from a mechanical dentist's standpoint.

I don't know as I have very much to say on this question, as I believe that if mechanical dentistry were barred, absolutely barred, from the practice of dentistry, dentistry would be better.

Yet I don't regret the days and nights I have spent in the practice of mechanical dentistry; I think it has been a help to me, and it seems to me that dentistry has come to such a stage that teeth can be saved without mechanical dentistry being called upon. And so far as the colleges are concerned, it is a mistake to say that they do not give enough time to mechanical dentistry; but the first question of the evening is how to make dentistry a profession. That interests me more than all. The first thing necessary is brains.

It is brains that we need to make dentistry a profession; we must have brains enough to know how to charge for our work. The average man is simply seeing how much service he can give for the least amount of money.

It is one of the most ordinary occurrences for me to have patients come into my office and say that they are told by very worthy members of our profession that they were foolish to come to Dr. Conrad when Dr. Blank would do the work for so much less. We ought to charge proportionately to the quality of work rendered. Because many do not, is the reason dentistry is not a profession, and never will be until men quit that.

Dr. G. A. McMILLAN, Alton, Ill.: This is the first time I have ever heard a paper upon mechanical dentistry read in this society. It seems a singular statement, but, to my knowledge, it is the first one, and I am very glad indeed to see some man with courage to read such a paper. I have often thought of it myself, and wondered why some one did not take the subject up, and simply from lack of courage have refrained from doing it myself. This part of dentistry has been looked down upon, and I believe it is from this fact more than for any other reason that the rubber plates have given this check to mechanical dentistry. I noticed it this summer during my vacation, and I find that cheap dentistry is more often met in London than I have ever seen it in America. In London I saw a number of houses where they had the lower floor with

show windows filled with specimens of mechanical dentistry of all sorts and conditions—as many as five hundred sets of teeth in one window. Just like a merchant showing his wares.

I have never been satisfied with my mechanical dentistry. I believe that it takes more artistic skill to make a plate properly and artistically than in any other part of dentistry to-day, and I am not satisfied with my work as a mechanical dentist. We meet more difficult conditions here than in any other department of dentistry. To restore the face after the teeth have been extracted to its original contour is, to my mind, a difficult feat. And, in my opinion, that part of dentistry has been neglected.

So far as the mechanical part of dentistry is concerned, it seems to me that if that were eliminated there would not be much left. There is very little of dentistry that is not mechanical. I think if we made better plates we would do a great deal to elevate the profession; for there is not anything in the whole profession that bothers me half as much as how to restore a face to a good contour.

PACIFIC COAST DENTAL CONGRESS.

The general committee of the Pacific Coast Dental Congress has changed the date of holding the congress from August 17-21 to July 13-16 (inclusive), in order that those desiring to attend may have the benefit of the reduced railroad fares granted to the Christian Endeavor Convention, which meets in San Francisco, July 9, 1887, for which a round trip rate of \$50 from Chicago, with proportionate rates from other Eastern points, has been established. For the Pacific Coast States, excepting California, a reduction to one-half rate for the round trip has been agreed upon, provided, visitors from these States and the East arrive by July 9. The tickets are good for sixty days.

For California the rate will be one and one third fare for the round trip; tickets good for sixty days; visitors to arrive at any time during the convention or dental congress.

You are cordially invited to attend the congress, and urgently requested to contribute to the program.

All theses and communications of a similar nature must be in the hands of the program committee by June 15, to facilitate the arrangement of the program, and should be addressed to Dr. Frank L. Platt, chairman of program committee, room 80, Flood Building, San Francisco, Cal. Very sincerely yours,

THE PROGRAM COMMITTEE,

FRANK L. PLATT, *Chairman*.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

QUEER, ISN'T IT?

Under the above caption, the *Dental Digest* of May, 1897, gives vent to its tale of woe. One of the "oldest dental journals," the *Dental Register*, has committed the sin. The *Digest* says: "In the May, 1896,* number of the *Register* appears an article on the 'Removal of Deposits Upon Teeth,' by Dr. I. A. Freeman, of Chicago. This article and the discussion as taken down by the *Digest's* reporter, is copied from the March, 1896,* number of the *Digest*, yet not a word of credit is given this journal. Such a lack of editorial courtesy is deplorable!" O, *Register*, you old sinner!

In the same issue, the *Digest* (May, 1897), in an editorial on "Plagiarism and Consistency," first quotes from the *Cosmos* showing what a fearful sin plagiarism is, then it gently illustrates, showing that the *Cosmos* is inconsistent, quoting an article first published in the *Digest* in December, 1896, then the rehash of the *Cosmos* in February, 1897.

The *Digest* then calls special attention to the "stealing of matter," "pilfering," etc., on part of the *Cosmos*.

Now we want to take the *Digest* to task on the little item, "Queer, Isn't It?" Well, it is queer. The *Register* republished the item from the *Digest* without giving it credit. The *Digest* itself secured a copy of the paper from Dr. Freeman and published the article without authority or privilege, and in face of the stipulated rule of the Chicago Dental Society that papers read

*1897 is meant. [ED. REVIEW.]

before it shall be published in THE DENTAL REVIEW, which, in consideration therefor, employs at its own expense a stenographer, who makes a report of all discussions; after these have appeared in the REVIEW, other journals are welcome to use them and give due credit.

The *Register* copied certain matter from the *Digest*, that matter belonged to and was paid for by THE DENTAL REVIEW. Then again, in the May issue (due May 15), THE DENTAL REVIEW published an article on the "Mouths of Our School Children," by Dr. Gramm, of Chicago. This is republished by the *Digest* (due May 28), without credit.

Who says "stealing and pilfering matter," plagiarism," etc?

DEATH IN THE RANKS.

During the past few months the silent reaper has gathered several of our noted men. Dr. John C. Storey, of Texas, one of the leaders in the south has passed away. Dr. Storey was a man of mark in the State of Texas, a former president of the Southern Dental Association, editor of the *Texas Dental Journal*, and an all-round dentist of natural and acquired ability. Dr. Storey was a strong character and an aggressive as well as a progressive man. Educated as a surgeon he practiced with conspicuous success and after the close of the war he studied dentistry and made for himself a name as a close student and profound thinker.

Dr. Frank Abbott, of New York, one of a coterie of industrious workers under Heitzman. He contributed to the periodical literature of the day as well as to the transactions of the various societies of which he was an active member to the last. He was at the head of one of the largest and most successful schools in the country and died in the harness.

Dr. Ingersoll, of Iowa, was also a noted character and made his influence felt, more largely in the west. Dr. Ingersoll was a pungent contributor to dental journals and was also the author of a book which has been translated into the French and Spanish languages.

On the other side of the water Salter, the author of *Salter's Pathology and Surgery*, died in April. He had long since ceased active practice, but kept up his interest in matters dental to the last.

The latest of the noted men to pass away was Magitot, one of the most learned and versatile men of our time. Magitot was about sixty-five years of age and for forty years his pen had never been idle. He was best known on this side of the water by his "Dental Caries" and his "Chronology of the Dental Faculty." His work was of a substantial character, and although much of it will not endure, he made his impress on the current thought of the times in an unmistakable manner. He was first of all a medical man practicing dentistry and did much to join the practice with that of medicine. The writer had known Magitot for nearly twenty years and it is not saying too much to say that he was a large hearted, generous, professional brother. He had, in our opinion, too little thought of the feelings of those practicing in France as dentists, but he was always striving to make dentistry or stomatology a distinct specialty of medicine. He was the editor of a classical journal, not much read, but of undoubted value to science. We mourn the loss of these men for we knew them well and we feel that in speaking of them the profession will feel that it has sustained a great loss in their somewhat sudden departure from scenes of activity.

MEMORANDA.

Koch has a new tuberculin.

The Pacific Coast Dental Congress will meet in San Francisco, July 18.

The Tennessee Dental Association will meet July 6, 7, 8 and 9, at Nashville.

The Missouri State Dental Association will meet at Pertle Springs July 6, 7 and 8.

The Kentucky State Dental Association will meet June 17, instead of the 24, at Owensboro, Ky.

The American Dental Association will meet at Old Point Comfort, Va., the first Tuesday in August.

Did you ever try to fill a tooth with cohesive gold and tinfoil combined? It should be used without annealing.

Dr. L. C. Ingersoll, of Keokuk, Iowa, is dead at seventy-four. Dr. Ingersoll was for many years a leading dentist of Iowa.

Dr. C. T. Gramm's paper has already received the honor of republication as an original article by one of our cotemporaries.

Wallis says if you smear soap on a mouth mirror then polish it, it will not be blurred by the breath. Glycerin will do the same thing.

Dr. W. S. Hosford has been elected dean of the dental department of the Iowa University.

Dr. T. E. Weeks has resigned as dean of the dental department of the University of Minnesota.

The same old song is being sung over coagulants and noncoagulants that used to be sung over capping pulp with oxychloride of zinc. They don't use zinc now.

STATISTICAL BOARD OF DENTAL EXAMINERS.

J. L. Bingham, Chicago; J. H. Smyser, Chicago, Secretary; Homer W. Pitner, Fairfield; A. C. Barr, Alton; W. C. Jocelyn, Cairo, President.

L'Odontologie says that Dr. Bödecker, of New York, was called to Berlin to attend a member of the imperial family. He declined however to transfer his abode to Berlin.

Dr. E. Magitot, of Paris, is dead. Dr. Magitot was easily the first among scientific men in the dental profession in France, and his loss will be mourned as a national calamity.

S. James A. Salter, the author of Salter's pathology of the teeth and dental surgery, died recently at Basingstoke, Hampshire, England. Mr. Salter retired from practice in 1881.

Wonder what will happen to the National Association of Dental Examiners? Two journals are now at the ears of said association. Under what circumstances do we look at the association as editor, teacher or dentist?

It will be noticed that Dr. I. A. Freeman's paper last month, "The Removal of Deposits upon Teeth," is illustrated, and had the author's careful revision; while the pirated paper was without illustrations or revision.

Dr. Grafton Munroe, of Springfield, is the new librarian of the Illinois State Dental Society. Dr. Munroe is one of the growing dentists of the Capitol City of the State, and sometime or other he ought to be a member of the American Dental Association.

If you live in Switzerland and are an employe of the stage route or in any other public labor, you must not have the toothache or you will have to pay for a substitute if you have it filled. The director of one of the companies says that to cure a toothache it must be "pulled."

LIGHT.

For the benefit of those dentists whose operating windows face east, west or south, I suggest curtains made of architect's tracing cloth. It is thin, white, and so diffuses direct sunlight as to produce the effect of reflected light from a bank of white clouds. The expense is trifling and the result very soothing to the eyes of the operator.

E. G. BETTY.

"While visiting the British Museum some time ago I was much interested in the skull of an Egyptian mummy, an official who flourished during the XI. dynasty or about 2600 B. C. The right upper first molar region showed distinctly the loss of bone from abscess while there were two such examples on the left lower jaw. Two of the lower incisors were denuded almost to the apex anteriorly from pyorrhœa alveolaris. The teeth were regular, well formed, and had suffered but slight

decay, though I think from abrasion that the subject must have attained the fortieth year."—From Dr. H. J. Custer's letter, London, May 14, 1897.

WISCONSIN STATE DENTAL SOCIETY.

The twenty-seventh annual meeting of the Wisconsin State Dental Society will be held in senate chamber, Madison, Wis., July 20, 21, 22, 1897.

The Monona Lake assembly will be held during the same time, thus securing the reduced rates of a fare and one-third on all railroads. The State Board of Dental Examiners will meet at the same time and place for the purpose of examining candidates to practice dentistry.

W. H. CARSON, *Secretary*,
128 Wisconsin Street, Milwaukee, Wis.

THE INDIANA STATE MEETING.

The Indiana State Dental Association will hold its thirty-ninth annual meeting in Fort Wayne, commencing at 10 o'clock A. M., June 29, and continuing through three days. Members of the profession are cordially invited to be present to participate in the proceedings.

Monday, June 28, at 2 P. M., the State Board of Dental Examiners will meet in the New Aveline hotel to examine all applicants coming before it.

M. A. MASON, D. D. S.,
Secretary.

THE CHICAGO DENTAL SOCIETY.

CHICAGO, May 26, 1897.

At the meeting of The Chicago Dental Society, held on May 4, 1897, the following resolution was offered by Dr. Truman W. Brophy and unanimously carried:

WHEREAS, The dental colleges and State Dental Boards of the United States have been charged by dental societies of Europe with methods which are not only degrading to American dentistry, but result in a positive injury to the people, and are especially humiliating to skillful American dentists practicing abroad;

It is charged and truly so, that foreigners unable to speak and understand the English language and in many instances possessing limited or no knowledge of dentistry, have been admitted to advanced classes of our colleges and permitted to graduate;

Moreover, that our State boards have also examined such candidates through interpreters and after receiving their certificate, these foreigners have returned to Europe and announced themselves as American dentists.

Resolved, It is the sense of the Chicago Dental Society, that all candidates for admission to our colleges be examined in the English language; also that our State Dental Boards conduct their examinations in English.

GEO. B. PERRY,
Cor. Secretary.

A. H. PECK,
President.

GOOD, BUT WE KNEW IT LONG AGO.

Metallic silver as an antiseptic. Dr. Credé advocates the use of silver and silver salts, which he has found from a year's experience to be very effective, sure and safe antiseptic agents in the treatment of wounds. An incision made in a surgical operation is covered with gauze impregnated with finely divided silver. When such gauze is used for ulcerated or wounded parts which secrete freely, the silver is attacked by the products of decomposition and is converted into a lactate of this metal, which, though an active neurotic agent, is very irritating. Open sur-

faces, therefore, of some standing are covered at first by powdered citrate of silver (itrol) and then excluded from the air by the silver gauze. The results, he asserts, have hitherto been very good, and he regards the silver dressings as being most reliable in the treatment of all forms of wound. Silver bands around the roots of teeth affected with pyorrhœa alveolaris have lately been recommended as a cure for this disease, and we certainly think that the employment of the silver salts as a dressing deserves a fair trial.—*B. J. D. Science.*

CHICAGOANS GET PLACES.—GOV. TANNER NOMINATES NEW MEN TO THE ILLINOIS DENTAL BOARD.

The governor has transmitted the following appointments to the senate:

Members of the Illinois Board of Dental Examiners—J. L. Bingham, of Chicago, to succeed A. W. Harlan, resigned.

J. H. Smyser, of Chicago, to succeed L. L. Davis, resigned.

Homer W. Pitner, of Fairfield, to succeed L. Irons, term expired

A. C. Barr, of Alton, to succeed G. A. McMillan, term expired

W. C. Jocelyn, of Cairo, to succeed J. W. Wassall.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

CHICAGO, May 26, 1897.

At the meeting of The Odontographic Society of Chicago, held on May 10, 1897, the following resolution was offered by Dr. Frank H. Zinn, and was unanimously carried:

WHEREAS, The dental colleges and State dental boards of the United States have been charged by dental societies of Europe with methods which are not only degrading to American dentistry, but result in a positive injury to the people, and are especially humiliating to skillful American dentists practicing abroad;

It is charged, and truly so, that foreigners unable to speak and understand the English language, and in many instances possessing limited or no knowledge of dentistry, have been admitted to advanced classes of our colleges and permitted to graduate:

Moreover, that our State boards have also examined such candidates through interpreters, and after receiving their certificates these foreigners have returned to Europe and announced themselves as American dentists.

Resolved, It is the sense of the Odontographic Society of Chicago that all candidates for admission to our colleges be examined in the English language; also, that our State dental boards conduct their examinations in English

H. H. WILSON, *Secretary.*

GEORGE B. PERRY, *President.*

AMERICAN DENTAL ASSOCIATION.

Editor the DENTAL REVIEW:—The American Dental Association will hold its next meeting at Old Point Comfort, Va. Tuesday, August 3, 1897. This will, probably, be the most important meeting of the American Dental Association held in years, as it is expected that the entire question of reorganization will be presented for settlement. It is therefore earnestly desired that each organization in affiliation with the American will make a responsive effort to have a full delegation present at Old Point Comfort, and have this representative body instructed in regard to the position held by your society in relation to this question

It is further suggested that each society should devote at least one evening to the discussion of the question: Whether a change in the relations of the two so-called national bodies, the American Dental Association and the Southern

Dental Association, be desirable? In this way thought may be crystallized, and each delegate be prepared to meet the subject with the intelligence its importance demands.

Each State and local society which has adopted substantially the same code of ethics as that governing the conduct of members of the American Dental Association is entitled to one representative for every five members and fractional part thereof.

Blank certificates for delegates may be had on application to the corresponding secretary.

By order of the President, Dr. James Truman.

EMMA EAMES CHASE,

Corresponding Secretary American Dental Association.

OBITUARY.

L. C. INGERSOLL, D. D. S.

Ingersoll—At the family home, 710 North Seventh Street, in this city, May 24, 1897, Dr. Luman C. Ingersoll, aged 73 years, 7 months and 28 days.

Deceased was a native of New York. He came to Keokuk in 1858, and had resided here continuously ever since. Dr. Ingersoll was twice married; his first wife, who was Miss Maria Porter, died in 1888. His second wife was Miss Minnie Banks, to whom he was married in this city in 1890. Up to a very few years ago Dr. Ingersoll was very active in the practice of his profession, dentistry, in which he took high rank and was easily among the leading practitioners of the west.

During the active years of his life Dr. Ingersoll was a leader in his profession. He was a member of the State Dental Society, of which he was president for three years, and for nearly ten years he was dean of the faculty of the dental department of the Iowa State university. During a quarter of a century he was connected with college professorships, and was a member of the faculty of the Keokuk Medical College from the time the institution was organized. His literary attainments served him well in the preparation and completion of an extensive work on dentistry. Dr. Ingersoll was a man of high scholarly attainments, broad intellectuality, and thorough education. He was a man of a kind and gentle disposition, big hearted, good natured, generous and helpful, a member for many years of the Congregational church, and a man whose death is mourned by all who knew him.

Funeral services, conducted by Rev. W. L. Byers, were held at the family residence Friday afternoon. The pall bearers were Dr. Walton Bancroft, J. A. M. Collins, Sylvester Carter, J. C. Daniels, Frank H. Jones and William Rees.

RESOLUTION OF RESPECT TO DR. INGERSOLL.

WHEREAS, The Allwise Ruler of the Universe has, in his infinite wisdom, removed from our midst our highly esteemed fellow-laborer, Luman C. Ingersoll, and

WHEREAS, The intimate relation held by him during a long and useful life with the dentists of Keokuk, Ia., makes it fitting that we record our appreciation of him; therefore

Resolved, That the wisdom, fidelity and ability which he has exercised in science, literature, art, research and council to aid in establishing and advancing the profession of his choice, will always be held in grateful remembrance:

Resolved, That the removal of such a man from among us where he has held a leading position for more than forty years, leaves a vacancy that will be deeply realized by all.

Resolved, That we extend to his bereaved family and relatives our earnest sympathy and mourn with them in this sad affliction.

D. W. MILLS.

B. C. HINKLEY,

J. W. STARK,

Committee.

THE DENTAL REVIEW.

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No. 7

ORIGINAL COMMUNICATIONS.

HOW SHALL WE BEST INSERT A GOLD FILLING.*

BY ARTHUR GALUSHA SMITH, D. M. D., PEORIA, ILL.

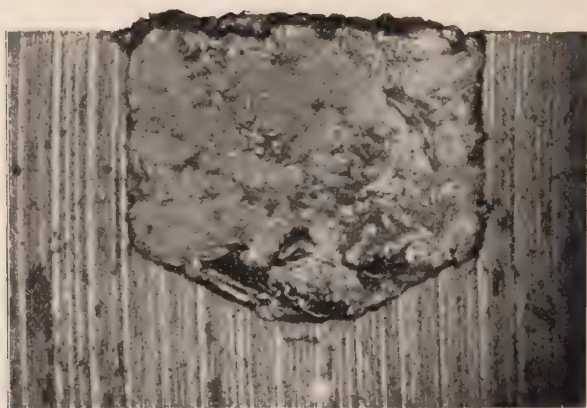
The unusual is always interesting and occasionally beneficial and instructive, but I venture to say that not 5 per cent of our members give a majority of their time to those operations which may be fairly counted as rare while we go on day after day seeing and treating practically nothing that is out of the ordinary. Therefore it is to the everyday affairs of our profession that we must devote the greater part of our care, study and attention if we would give to our patients the greatest possible amount of comfort and satisfaction, achieve success for ourselves and bring credit upon our calling.

The subjects of replantation, implantation, devitalization, local anæsthesia, successes and failures of crowns of various kinds, porcelain inlays, gold inlays, the latest and most fashionable cure for pyorrhœa, the all-absorbing topic of cataphoresis, these in turn have each arisen, and like comets of greater or less magnitude have spread themselves over the sky of dental thought and investigation and for the time being, obscured many of the trustworthy guiding stars that have burned steadily since the dawn of our career as a separate and distinct profession.

Of the many operations that have served to bring us onward and upward in years past, that faithfully maintain us where we now stand, and that continue to lure us forward with promises of richer reward and higher achievements in the future, none has been more

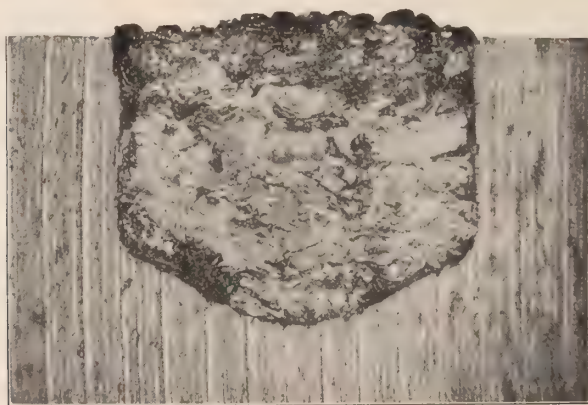
*Read before the Illinois State Dental Society, May, 1897.

constantly and uniformly prominent than that of restoring portions of the teeth that have been destroyed through caries, wear, or accident with gold. It has required years to bring the gold filling to



No. 1.

its present degree of usefulness and perfection, but its history, though interesting, does not at present concern us. What *we* should strive to find out and thoroughly understand is, what con-

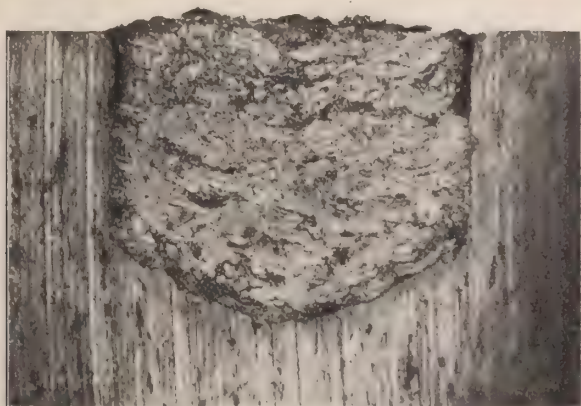


No. 2.

stitutes, to-day, the best gold filling, and what is, all things considered, the best means of producing it.

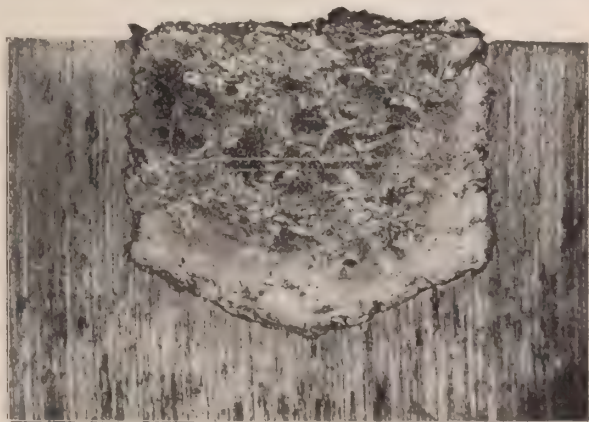
I need only allude to the two distinct kinds of gold used in

fillings, namely, "soft" and "cohesive." A "soft" foil, strictly speaking, cannot be rendered in any degree cohesive by annealing. However, many of the so-called soft foils now on the market will



No. 3.

develop a certain amount of cohesion when annealed. A "cohesive" foil on the contrary is rendered so sticky by annealing that a mere touch will unite two pieces, while a blow or heavy pressure

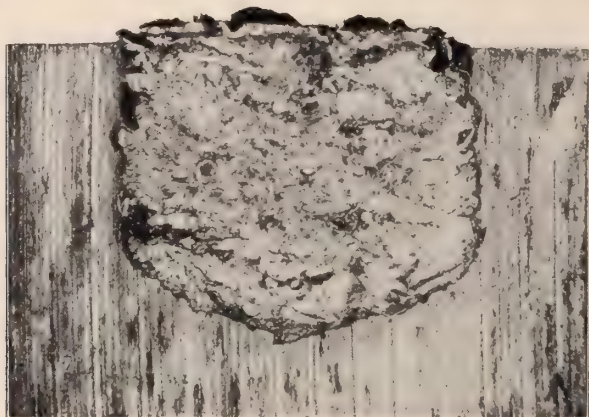


No. 4.

will make them become as if of one piece. These differing properties of the gold as it comes to our hands from the dealers, are fixed and unchanging and must be carefully borne in mind as

they make the two kinds of gold almost exact opposites in working properties.

I believe that cohesive gold is now in far more general use



No. 5.

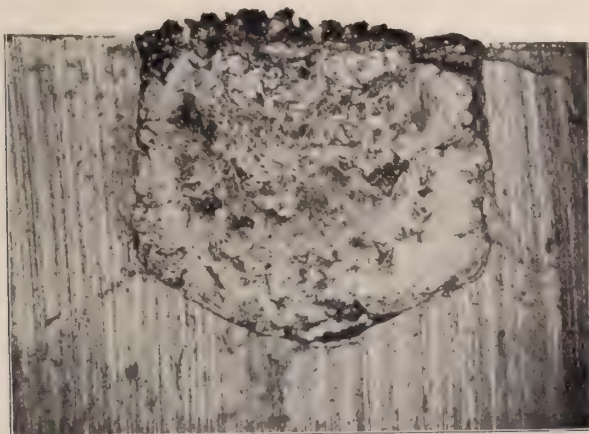
than the older soft variety and it is chiefly with the subject of cohesive gold that it is the purpose of this paper to deal, for I have yet to see the cavity that it was possible or desirable to fill with



No. 6.

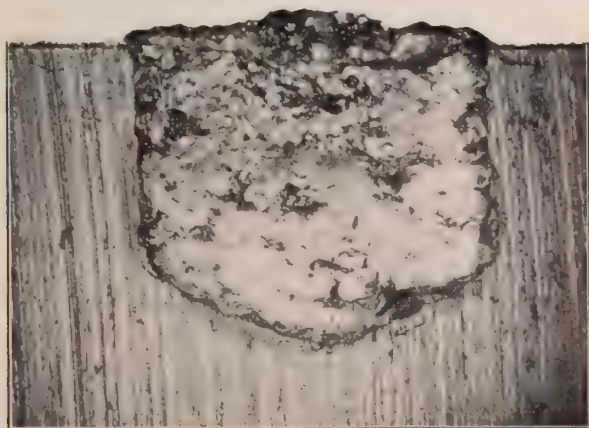
gold at all, that, to my mind, could not be better filled with cohesive gold than with soft gold either alone or in combination with cohesive. I am well aware that this is a broad statement and one

that is not generally accepted ; for, while there are comparatively few fillings now made entirely of soft gold, nevertheless many operators still cling to it as of peculiar and almost supernatural effi-



No. 7.

cacy in starting fillings and in "protecting" the cervical margin. (I might remark right here that the term "protecting the cervical margin," which is in such universal use, is a very happy one, as

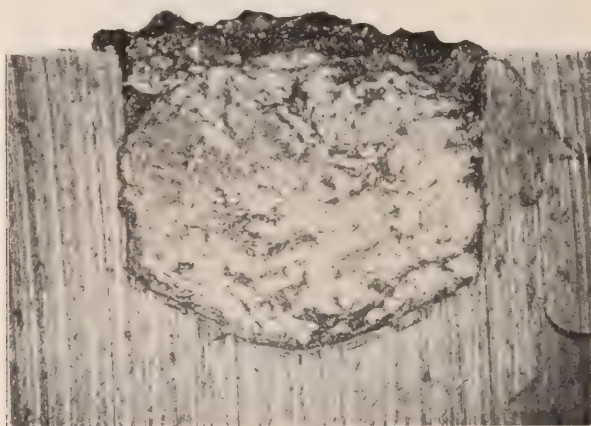


No. 8.

most of the cervical margins we see are in dire need of "protection" of some sort.) There are reasons for the preference shown soft foil in the two places mentioned, namely, its easy working

properties, the rapidity with which the starting of the filling can be accomplished, and the general wholesale manner in which the cervical margin can be "protected" and the deepest and most inaccessible portion of the cavity filled gotten out of sight and disposed of.

Of course there are cavities which have no cervical margins and practically no inaccessible portions. I refer to the box-like cavities having four walls, and these are the only cavities where a filling made entirely of soft foil, are now, I believe, even advised; but even in these simplest of all cavities I still think that cohesive gold is far the better material to use and for reasons that I shall strive to make clear before I finish.



No. 9.

We are all familiar with the soft gold fillings in crowns and buccal surfaces of short yellow molars, that have been in so our patients tell us (and I have not the slightest doubt that they speak truly), "ever since s'teen years before old Dr. So and so died, who was a fine dentist but awfully rough." These fillings have done great service and all honor to the men who put them in, but how about it when we come to approximal cavities in the bicuspid?

I doubt if there is a practicing dentist in this room who has not had to remove gold fillings from these cavities and in so doing how often do we take out of the grinding surface a hard nugget of cohesive gold and then from the cervical third of the cavity dig out a mass of soft gold that seems to be somehow disintegrated

and like so much yellow sausage. Again, how often have we seen soft gold fillings that are battered out of shape, rough, uneven, pitted, discolored, and a disfigurement to the tooth. The cohesive filling is more dense, is harder and wears longer, is susceptible of and will retain a higher finish than soft gold ever can.

The objections to the use of cohesive gold are chiefly its difficulty of manipulation, length of time required for its insertion, necessity of keeping the tooth perfectly dry during the entire operation, the alleged difficulty of making a good adaptation to the cavity walls, expense and discomfort to the patient. Were it not for these few objections cohesive gold would be almost the only material used for filling teeth to-day.

Unquestionably it often is a difficult matter to start a filling with cohesive gold, that is to get the first few pieces firmly anchored in place. Especially is this true if we try to make the start with foil and the cavity happens to be one where we can see nothing except in the mirror. Happily we have cylinders, mat and sponge gold to help us out of this difficulty. These are all true forms of cohesive gold but owing to the peculiar properties imparted by the processes of their manufacture can be gently thrust into the cavity where we can coax them into undercuts and retaining grooves and condense them at our leisure. I use very little mat gold and never depend on it for any anchorage strength, simply a very tiny piece at the start for the purpose of saving time. Any filling may be started with cohesive foil, if our skill and patience are adequate.

Now we come to what in itself constitutes the major portion of the operation, namely, the condensation. For this purpose we have live blow and dead blow hand mallets, automatic mallets, pneumatic mallets, mechanical mallets, electrical mallets, in short, nearly every kind of mechanism that can be devised to deliver a blow at all, and last but by no means least, we have hand pressure, and it is to hand pressure condensation that we must look for deliverance from many of the evils already mentioned as being connected with cohesive gold.

In order to show the results of hand pressure and the mallet condensation more distinctly I have made a series of fillings which I shall presently show you with a view of testing the mallet and hand pressure side by side.

You can readily see that with as many kinds of foil, mallets,

pluggers, etc., as there are now on the market there is no end to the combination of instruments and material that it is possible to make and it would obviously be impossible for me to exhaust such combinations in practical experiment. What I have striven to do is to make fillings which should be representative of their class and to make them by methods with which I felt myself to be reasonably familiar and well skilled.

To make these cavities I had holes drilled in the most accurate manner possible in untempered tool steel. The holes being of absolutely uniform size and depth. I then had these steel ingots containing these holes planed on one side until one-half the diameter of the holes had been planed away, thus leaving cavities in the steel that were as nearly as possible the size and shape of a moderate sized approximal cavity in a bicuspid.

The margins of the cavities were in all cases prepared with a hand chisel, the same as if the work were being done in the mouth. I next took a piece of true edged plate glass and placed it on what would correspond to the approximal surface, as if it had been a matrix. The steel ingot containing this cavity with this glass matrix in position was then imbedded in plaster. After the plaster had become thoroughly dried, slight undercuts were made with the engine and the cavities were filled each by a different method which I will describe as I show the results.

In making these fillings my assistant placed the gold and kept count of the number of pieces used while I myself kept count of the number of blows or thrusts and of the time consumed in the operation. So far as I am able to judge I showed absolutely no discrimination in my work, merely trying to produce a filling which should be good of its kind. I put forth no special effort at any time to produce an operation that should "show up well" or prove any of my pet theories nor did I at any time use a force, either of mallet or hand pressure that could not be easily borne by even a frail tooth.

EXHIBIT OF SLIDES.

No. 1. Filled with cohesive foil, using finely serrated flat pointed pluggers, 49 pieces, 750 thrusts of plugger, time 18 minutes.

No. 2. Filled with cohesive foil, using a slightly coarser serration, same size point, 56 pieces, 650 thrusts of plugger, time 15 minutes.

No. 3. Filled with one-half cohesive cylinders, using smallest Royce point made, 35 pieces, 620 thrusts of plugger, time 13 minutes.

No. 4. Filled with one-half cohesive cylinders, using finely serrated square pointed pluggers, same as on No. 1. 38 pieces, 618 thrusts of plugger, time 15 minutes.

No. 5. Filled with one-half cohesive cylinders, using coarser serration, same as No. 2. 39 pieces, 540 thrusts of plugger, time 13 minutes.

No. 6. Soft foil rolled in cylinders, time of inserting 6 minutes.

AUTOMATIC PLUGGER CONDENSATION.

No. 7. Filled with cohesive foil, cut in small pieces, using medium serrated plugger, time 22 minutes, 910 blows. (This ought to be the best of the lot.)

No. 8. Filled with one-half cohesive cylinders, using automatic plugger of medium serration, 36 pieces, 750 blows, time 18 minutes.

No. 9. Filled with one-half cohesive cylinders, using same size Royce point, same as No. 3. 44 pieces, 762 blows, time 17 minutes.

Several things appear in these results which are a decided surprise to me. For instance, I had always supposed that a blow from the mallet would accomplish more in the way of condensation than a thrust of a hand instrument, though I was thoroughly sure that it was not as good for the tooth. These tests, however, show conclusively that working on the same material it requires more blows than thrusts to pack a given number of pieces in a cavity of a definite size. Thus in No. 4 38 pieces were packed in the cavity with 618 thrusts in 15 minutes, while in No. 8, using the mallet, 750 blows were delivered in 18 minutes, and only 36 pieces of gold were gotten into the cavity at all.

In other words a slightly greater degree of condensation was reached by using an average of $16\frac{1}{3}$ thrusts to the piece than when using 21 blows to each piece of the same size. Also I was surprised to find that hand pressure consumed less time than the automatic.

So much for the tests outside of the mouth, but it is in practical work at the chair that all operations must be finally tested, and in this connection there are many things to be said in favor of

hand pressure. To begin with, by this means force can be applied in any direction with almost equal facility, and this fact alone makes the number of "inaccessible" cavities very small indeed. When one becomes accustomed to hand pressure, there are absolutely no cavities in the mouth easier to fill than those in the distal surfaces of the superior cuspids, bicuspid, and first molars. Work on the incisor can be done from the inner or palatal side with the greatest ease both to patient and operator, as the chin does not interfere with the plugger handle, even when the mouth is partially closed.

Large buccal cavities on the molars (especially those on the third) are almost impossible to reach and fill with any instrument which depends on a blow for its efficiency, for no matter what the shape of the plugger point may be, the force of a blow at the end of the instrument must always travel exactly parallel to the long axis of the handle or shaft; it is thus utterly impossible, in many instances, to properly pack against a buccal or an anterior wall, when the cavity is situated far back in the mouth, with any mallet with which I am acquainted. Again in hand pressure the sense of touch is not benumbed and partially paralyzed by a heavy and cumbersome instrument as is the case with the automatic, or by any rattling or clattering vibration as with many of the other forms. An important point in all gold fillings is to get them condensed evenly, and there is no way of getting information with regard to how far we have carried our condensation except through the sense of touch. We condense a filling, do we not, until it *feels* hard enough, and we *feel* that it is time to add the next piece.

The lighter and more rigid the instrument with which we feel, the more accurate is our information sure to be. Who would tolerate a handle of the size, weight and looseness of an automatic plugger on an excavator or chisel. Such an instrument would be the laughing stock of the profession should any one try to put it on the market. Who would try to prepare a cavity margin with an instrument vibrating and chattering about as do the electrical, pneumatic and mechanical mallets? Surely no one. Would we not say that such instruments as these were far too clumsy for such accurate and delicate work? Yet if there is one thing that we need to do more accurately than another it is to perfectly

adapt our gold to the margins and walls of the cavity we have made.

No matter how perfect our preparation, no matter how neat and beautiful the finish of the filling, if at any point we fail materially in our adaptation the great majority of our work is sure to fail, and when we see it as the years go by, we ourselves deep down in our own hearts will know that we have failed and fallen short of what we should have accomplished, even though our patients are satisfied that it was "all their fault," and cheerfully have the work replaced with faith in us unshaken and unwavering.

The teeth are by nature designed to withstand pressure, but not blows.

Dr. Black, in his experiments with the gnathodynamometer, some two or three years ago, showed us conclusively that it was almost impossible for a person to injure the teeth by exerting the extreme force of the muscles of mastication, provided that force be exerted gradually, but how different is the result of the same muscular action when we bite suddenly on some hard substance and thus give a blow to the teeth.

In other words, we recognize the necessity for avoiding blows upon the teeth and instruct our patients to avoid them as far as possible, and yet we ourselves make such large use of them in condensing gold. Is not this an illogical position on the very face of it?

I have seen many large and beautiful fillings that were made with the mallet, but in very many of them there have developed large pits or soft places, showing that the condensation was not even. Again, many of the teeth containing large malleted fillings are so badly checked as to be beyond repair as soon as the first chip falls out of the cavity margin.

Loosening and soreness of the teeth is always the immediate result of any considerable amount of malleting, and this sometimes never entirely subsides.

With the use of hand pressure all these disagreeable sequelæ are much lessened or entirely done away with. How many times after the insertion of a large gold filling have my patients remarked in surprise "Why doctor, that tooth wasn't even sore the next day."

Finally we have to consider the operation from the patient's standpoint and here I can speak with feeling and appreciation

and utterly free from bias, for I think that I have had gold fillings put in by almost every known process except that of the Herbst burnishers and from the patient's standpoint I must say that no method of condensing gold with which I am acquainted is so free from discomfort and objectionable features. There is no noise or jar of any kind connected with the operation and this fact makes the nervous strain on the patient much less and this attitude of ease and rest in the person on whom we are working, adds much to the rapidity and freedom from tension with which we do our work.

My patients are warm in their praises of hand pressure and it was largely this fact that induced me to persist in using it and finally rely on it altogether. When they have a filling done in my office for the first time they almost invariably express the greatest relief and astonishment at the absence of what they usually term the "pounding" or "that little thumping machine." At this time when we are ostensibly striving so earnestly to take away those things which are sources of discomfort to our patients, can we afford to overlook anything which is so simple, so effective, and so free from discomfort?

No one mallets a filling from the very start. More or less hand pressure is necessary in order to carry the first few pieces of gold to place no matter what method we use in starting our fillings.

If this is more effective in carrying gold to place against the walls of the cavity at the start, can there be any valid reason why it will not secure a better adaptation throughout the entire operation?

I fully realize that no two men work exactly alike and that a method which is a success in the hands of one operator will be much less satisfactory in the hands of another, but I do believe that this matter of hand pressure condensation is worthy of an earnest trial on the part of every one of us.

I used to use the mallet as exclusively as any man possibly could and considered everything else too utterly out of the question, to be even seriously considered, but I came in close personal contact with a most expert operator who was an enthusiastic advocate of hand pressure. The beautiful results which he achieved and the ease with which he worked in cavities which were difficult of access to me and my mallet set me to thinking and finally to experimenting with that which I had formerly

been content with ridiculing. It required considerable time for me to get the muscles of my fingers trained so that they could stand the long continued exertion, and I had better pause here before I finish and say that it has not been a question of the easiest way to do a gold filling that I have been considering, but this was the only difficulty encountered and it has long since disappeared.

Some day when you have a cavity that is hard to get at in a satisfactory manner with your mallet—and you won't have to wait long for this opportunity—and rather small, just try hand pressure for awhile. If you get tired, take up your mallet and finish out with that, but *keep on trying* until your muscles become thoroughly accustomed to the work, and it will not be until then that you can pass a fair judgment on the work, and I am sure that you will do with your mallets just what I did with mine—let them lie in the drawer unused for a couple of years, and finally discard them altogether.

THE DIFFUSIBILITY OF COAGULANTS IN DENTINE.*

BY E. LAWLEY YORK, D. D. S., CHICAGO, ILL.

Having been many years engaged in the study of the chemistry of therapeutics, I have naturally been attracted to the articles by distinguished men published in our journals within the special field of our profession; and what I am now to present to you is based upon a careful study of the subject, together with the results of a long series of experiments, made by myself and then reviewed by others eminently qualified to criticise my efforts and to express an opinion as to their accuracy.

These experiments were made in various ways to show that carbolic acid will diffuse through dentine, in freshly extracted teeth that at the time of extraction were normal, also in teeth freshly extracted that had putrescent pulp canals; in the latter I found that there was slightly more rapidity of diffusion.

My first experiments consisted in taking a freshly extracted tooth, either having a normal pulp or a putrescent one; my experiments have been equally divided between the two classes.

After opening into the pulp chamber from the lingual or coronal aspect, according to the tooth that I was treating, and

after gaining sufficient room to pass a hypodermic needle into the pulp chamber, thus avoiding cutting away the tooth structure unnecessarily, I removed the pulp, dried the canal or canals, as the case might be, and sealed the foramen at the apex with gutta-percha. I then injected a small quantity of a 95 per cent solution of carbolic acid, which had been previously colored with a minute quantity of fuchsin, sufficient to fill the pulp chamber and about two-thirds of the canal, thus avoiding any oozing out upon sealing the crown with gutta-percha. I then wrapped the teeth in wet gauze and placed them in a receptacle I had made that would keep them at about 98° F. My aim through my experiments has been to make them as nearly as possible under the same conditions that are met with in the mouth.

The earlier experiments were generally with teeth left in the incubator twenty-four hours at least, but later I found that carbolic acid would pass through the dentine as far as the cementum in eighteen and one-half hours.

On taking them out of the incubator I made cross sections to preserve the bulk of the tooth for reference. In making a longitudinal section the tooth would be spoiled and only the section left; so that I should not have been able to show you the remaining portion from which the section was made. These were all mounted in Canada balsam, and show that the colored carbolic acid has passed entirely through the dentine. A vast number of these experiments were made with universal and satisfactory results; but to insure obtaining indisputable evidence, I commenced some other experiments in an entirely different way, which to my knowledge have never been attempted before. I will not weary you by repeating the manner in which the teeth were opened, pulps removed or canals cleaned; suffice it to say that the same mode of operation was observed in all my preliminary preparations of the tooth.

The next series of experiments consisted in placing in the canals and pulp chamber as much carbolic acid as would be used in the ordinary treatment of a tooth. After sealing the teeth I placed them in a bag that was tied to the nozzle of a faucet, and water was allowed to flow over them for two or three hours. The cementum was then ground off on two sides of the root, washed again, and the teeth suspended in water nearly up to their anatomical necks. The earlier ones I usually left twenty-four hours,

but later I found that eighteen and one-half hours was sufficient time to detect carbolic acid in the water with the bromine water test.

In some cases I coated the whole of the tooth with sandarac varnish to prevent the possibility of any carbolic acid coming in contact with the tooth structure. Out of the many hundred tests made I did not fail in a single case to detect carbolic acid in the water.

To make sure that I was doing this as carefully as possible, I requested my friend, Dr. J. G. Reid, to seal carbolic acid in some teeth. This he kindly consented to do. The results were just the same. I might also add here that the same gentleman has witnessed a great number of my experiments, and can vouch for the care I bestowed upon them to make one and all reliable. As a control test for the above I made two glass tubes to resemble teeth, as you will see (here show examples). Dr. J. G. Reid sealed one, and I the other. These have been placed in water indefinitely, with no reaction with bromine water. You will also notice that I have not even coated these with shellac varnish.

Later on, at the suggestion of Dr. P. J. Kester, I selected sound teeth whenever I could, and opened from the apex, slightly enlarging the foramen, and passing the carbolic acid in this way into the pulp chamber, then sealing and coating with sandarac varnish, washing, etc. I suspended the tooth in water, crown down, thus excluding any possibility of leakage. The results are just the same—carbolic acid in the water.

It is not necessary for me to give any more examples, for as I have already stated, the results were the same in every case.

The following experiment was intended to demonstrate that carbolic acid does not form an impenetrable coagulum at the orificial end of the dentinal tubuli, with their albuminoid contents.

A tooth was taken that had contained a 95 per cent solution of carbolic acid in the pulp chamber and canals for seventy hours. The canal was dried, and a saturated solution of sodium chloride was inserted by means of a hypodermic syringe. The end was sealed with gutta-percha and then coated with sandarac varnish. This was allowed to dry, after which it was washed one hour with water. The tooth, which had only been opened at the apex, was suspended in water, crown down, about two-thirds of its length being immersed. In three hours I tested the water with a drop of

a 25 per cent solution of argent. nitras, which resulted in large quantities of the chloride of silver being thrown down, thus proving beyond a doubt that the coagulum formed by carbolic acid is not a barrier to the passage of other substances through the dentine, as has been so often stated.

TEST FOR DIFFUSION IN COAGULATED ALBUMEN.

I took a hard boiled egg, sawed off one end, carefully removing first the yolk and then the remainder of the shell, placing the rest in a small wine-glass containing about one and one-half teaspoonfuls of water. I then poured in the space previously occupied by the yolk some carbolic acid. This was left for twenty-four hours, with the assurance from those who saw it that carbolic acid would never penetrate it. When I tested the water it was so loaded with carbolic acid that I had to pour it into a larger vessel to accommodate the quantity of bromine water required.

The next time I made this test I found carbolic acid would pass through in two hours.

A pulp which is in a congested or hyperæmic condition, as the result of blows, exposure, thermometrical changes, ingress of microorganisms, etc., is especially liable to disturbances resulting from blood stasis, owing to vessels both entering and leaving the same narrow foramen, consequently the pulp is in all probability subject to strangulation or stasis. The changes that now take place are not chiefly inflammatory, but necrotic followed by secondary decomposition and putrefaction.

Here we have to do with the death of tissue occurring under special conditions, and resulting in the formation of coagulated albuminoids; but the coagulation takes place, not in a liquid, but in the substance of formed tissue elements, in cells and cellular or intercellular structures. If by reason of arrested nutrition, or by the action of chemical or thermal agencies, a definite segment of an organ undergoes death, this gives rise to coagulation within the tissue for the reason that the lymph contains fibrinogen, the cells contain fibrinoplastin, and from these substances fibrin is produced. Hence Cohnheim introduced the word coagulation necrosis* to describe this special form of local death, viz., necrosis with fibrin formation.

Coagulation necrosis may also be found combined with other retrogressive changes, such as fatty degeneration.

*Ziegler. Text-book of Pathological Anatomy. Art. 36, page 65.

What we are in the habit of speaking of as ulceration is not true ulceration in a pathological sense, but in its incipency, at least, coagulation necrosis.

With this array of facts staring us in the face, what course of treatment are we to pursue? Nature is forming a coagulum. Should we not attempt to assist her by hurrying artificially those changes which she will in time produce spontaneously?

The late Professor Heitzman, of New York, says in the discussion of a paper read by Dr. A. W. Harlan before the First and Second District Dental Societies of the State of New York, January 8, 1895:

"Look at the canaliculi with a microscope after the coagulant has been applied. They have kept their shape, but the tenants, the threads of living matter, are shrunken and dry. Do you suppose that this dry material within the canaliculi is a fit pabulum for the infectious material? No.

"Again. If mischief arises, after a filling in the sense of Dr. Harlan, it is not the material as such that is to be blamed, but it is a mistake in the filling."

The cause, in my opinion, of so-called lame teeth, and it is also the clinical experience of a large majority of the best men in the profession, is imperfect root filling, not the use of coagulants. We so often see pulpless teeth in the mouths of our patients, without any root filling, when the whole crown is decayed away and the pulp chamber and canals are reeking with purulent matter. The patient will reply upon enquiry that the tooth has never given any inconvenience. This condition can only be accounted for in one way, namely, that the foramen is obliterated or closed—encysted if you like, consequently none of the septic matter can pass through the foramen and set up irritation and consequent inflammation of the peridental membrane.

I do not think there ever was a so-called lame tooth caused by the septic matter contained in the canal or canals of a tooth passing through the dentine and cementum, and setting up irritation and inflammation of the peridental membrane. It must pass through the apical foramen to cause such a condition.

Dr. Harlan, in a paper read before the Iowa Dental Society says: Carbolic acid melted was introduced into the pulp chamber very carefully, to avoid getting any of the acid in the crowns or on the outside of them. After the lapse of twenty-four or

forty-eight hours, respectively, iodine tincture was introduced in the same manner as first described above.

"If the iodine penetrated the dentine, it would pass through the cementum" and turn the starch blue. It did not penetrate, hence no blue stain.

Iodine is soluble in carbolic acid; carbolic acid is soluble in alcohol; both are coagulants. Carbolic acid is sparingly soluble in water, iodine is soluble in water 1 to 7,000 parts. "This is one of the best experiments that could be used as a test for diffusion."

Another series of experiments was made with the tincture of iodine alone. The results were negative.

To test the value of this experiment I ground a tooth and placed it in a bottle containing water. I took a small quantity, to which was added a drop of Lugol's solution of iodine. A few drops of the mixture were tested with dilute starch paste with no consequent reaction.

This was precisely the same test that Dr. Harlan made, with the exception that the teeth in his case were intact.

The reason there was no reaction was that the tinc. iodine combined with the salts of the tooth, and formed iodides of the base with which it united, leaving no free iodine. Consequently we could not get the reaction of the iodine.

Control test for the above.

The same starch paste, with $\frac{1}{10}$ the quantity of iodine and water, gave the blue iodide of starch very distinct.

The majority of the teeth used in my experiments were kindly supplied me by Dr. L. W. Nevius, a specialist in the extraction of teeth with nitrous oxide gas.

I desire herewith to acknowledge my grateful appreciation of the courteous assistance of the scientific gentlemen who have placed their laboratories and scientific apparatus at my disposal, and have contributed to my knowledge of the subject herewith presented.

Dr. Walter S. Haines, and his assistant, Mr. Riberg, of the Rush Chemical Laboratory; Dr. J. M. Dodson, Professor of Physiology, Rush Medical College; Dr. Le Count of the Pathological Laboratory, Rush Medical College; Dr. Weaver of the Bacteriological Laboratory, Rush Medical College; and Dr. J. G. Reid.

CLASSIFICATION OF CAVITIES, AND RULES GOVERNING
THEIR PREPARATION.*

BY W. E. HARPER, D. D. S., CHICAGO, ILL.

The subject in its present form is so treated trusting that the formulation of rules makes each point more clear and gives to them emphasis.

The diagram and classification of cavities given with rules for the preparation of each division practically covers all we are called upon to fill and enables us to decide upon at least one of the best methods for the preparation of any particular cavity.

For a thorough understanding and an intelligent discussion of the subject, I feel that it is necessary to show the cavity as a whole and keep it in view while elaborating the smaller details, that we may fully understand their relation one to the other and to the whole, and to the surrounding tissue. I hope to accomplish this with the large models and illustrations.

Much of the rules as given for the preparation of margins, seats and retention are based upon the requirements as presented to this society by our most worthy and honored member, Dr. G. V. Black; and in presenting this paper to you, the following quotation expresses my position exactly:

"I have here made only a nosegay of flowers and have brought nothing of my own but the string that ties them."

Rule 1. Extend cavity margins in every direction until sound enamel is reached.

The application of this rule requires special care in cavities occurring in the gingival third of the labial, buccal and lingual surfaces due to erosion or contact with secretions from diseased tissue.

Rule 2. A fissured, sulcate or angular developmental groove should be cut out in its entire length and included in the cavity.

In cavities occurring on the lingual surfaces of the superior incisors and occlusal surfaces of the bicuspid and molars, this rule should be strictly enforced.

Rule 3. Further extension should be made, if necessary, until full length enamel rods are supported by dentine.

In cavities for gold or amalgam, there are no exceptions to the application of this rule. The cavity margins should be extended

*Read before the Illinois State Dental Society, May, 1897.

by cutting the enamel rods in the direction of their length with a keen chisel. (When doing this the line of cleavage should be noted to enable us to best decide what bevel to give to the marginal edge.)

Rule 4. "Cut the enamel to such a point that the surface of the filling may be so formed that the enamel margin will be self-cleansing, or be protected by the gum margin." (G. V. Black.)

The labial, buccal and lingual margins of all proximal cavities should be extended sufficiently to permit contact of the lips, cheeks and tongue with the enamel margin, and to be further cleansed by the excursion of food over them during mastication.

The gingival margin should be carried beneath the free margin of the gum, or in cases of extreme recession or destruction of this tissue, to the widest part of the interproximate space. This would permit the circulation of the saliva to constantly render the gingival margin clean.

Rule 5. "Do not form an enamel margin in such a position as to leave a small portion of enamel between it and one of the developmental grooves." (G. V. Black.)

Margins on the occlusal or incisal surfaces which approach closely a developmental groove should be cut to or beyond that point, because of the great liability to breakage on these lines.

Rule 6. The outline of enamel margins exposed to view (as on the labial surfaces) should be in definite curves or straight lines.

Cavities occurring on the labial and buccal surfaces of the ten anterior teeth should be cut on harmonious curves or straight lines for æsthetic reasons.

Rule 7. The labial, buccal and lingual margins (the fillings of which are exposed to the force of mastication) should be parallel to each other and at right angles to the seat of the cavity.

In following this rule there is less danger of leakage along these margins and walls, as in case of shrinkage or slight crushing of the filling material, adaptation is still maintained at these points; if, on the other hand, these margins and walls are permitted to overhang, the filling is crushed against the seat and drawn an equivalent amount from the buccal and lingual margins, resulting in leakage.

All margins should be cut smooth, and after applying the above

rules, should be beveled, so as to avoid short ends and insure full length enamel rods.

RULES FOR THE PREPARATION OF THE SEAT AND STEP OF A CAVITY.

Rule 1. The seat must be flat or in steps (which is equivalent) and at right angles to the long axis of the tooth and direction of the strain.

The crushing strain is the force of mastication brought directly upon the exposed surface of the filling, and through it to the gingival wall of the cavity. This gingival wall, with any additional steps nearer the occlusal surface, constitutes the seat of the cavity, as it must carry the load.

The crushing strain is most effectually resisted by preparing the seat and steps perfectly flat, and at right angles to the direction of the force, thus avoiding any tendency to sliding under the influence of heavy strain.

To cut the seat, I use an inverted cone bur, holding it parallel to the length of the tooth.

Rule 2. The extent of the seat and step must be equal to the surface of the filling exposed to the strain.

DEFINITIONS.

Enamel margin.—A line on the surface of a tooth, forming the boundary of the cavity.

Marginal edge.—The cut surface of the enamel margin, including its thickness.

The classification of cavities given is based upon their form and location, and by its means we are able to formulate a few sets of rules which practically meet all the requirements for cavity preparation.

Presented in the form of a diagram, its simplicity can be readily appreciated, and enables us at a glance to assign any cavity to its proper class and division; thus insuring the application of rules best adapted to the requirements of the case.

In my judgment, the rules as presented would make ideal cavities, and should be enforced in general with but slight modification, although they permit considerable latitude should the operator have good reasons for the change.

If it be conceded that the practice so earnestly advocated by Dr. G. V. Black, of extension for prevention, is advisable, it will be seen by reference to Figs. 5, 6, 10 and 12, that the extension of

margins advocated in these rules is the minimum consistent with its accomplishment. A cavity prepared as shown by the dotted line g, Fig. 12, would have its buccal and lingual enamel margins i, j, located at the most vulnerable point; and if cut sufficiently to the buccal and lingual to render them in any measure self-cleansing, they would be too weak to permit grooving for retention, the step on the occlusal surface being the only safe method. So that in my judgment the rules given for cavities occurring on the proximate surfaces of bicuspids and molars, making contact with other teeth, meet practically all cases.

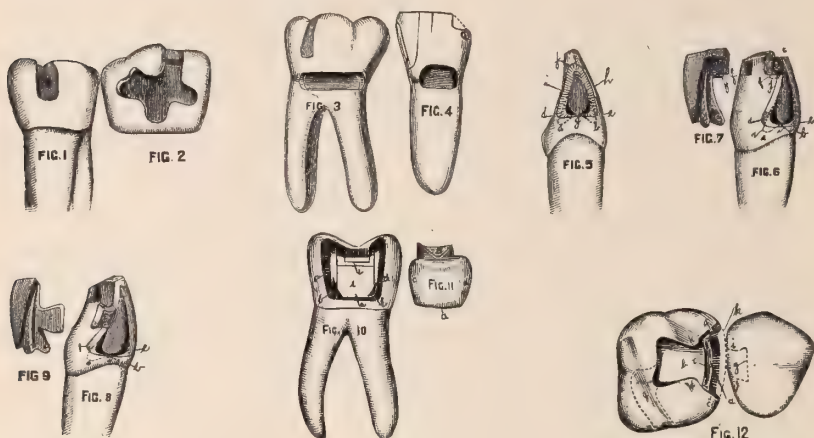


Fig. 1 and 2. The lingual surface of an upper molar and the occlusal surface of a lower molar showing cavities of class 1, division A.

Fig. 1. Shows the lingual extension of a cavity upon the occlusal surface including the entire length of the disto-lingual groove which is so generally sulcate or fissured.

Fig. 2. An occlusal cavity involving all of the developmental grooves, including the buccal which often terminates in a pit midway, occluso-gingivally, on the buccal surface.

Fig. 3 and 4. Show cavities of class 1, division B, a buccal and labial cavity, the gingival margins of which have been extended beneath the free margin of the gum into the cementum for protection and to avoid the thin triangular plate of enamel at the gingival line.

Fig. 4. Also shows a disto-incisal angle cavity, a; in these cavities the seat should be prepared flat to resist the force; if cut as shown by the dotted lines the filling is crushed against the inclined surface and the strain placed upon the retention which will result in a failure sooner or later.

Fig. 5. Represents a cavity of class 2, division A, on the mesial surface of an incisor; (the dotted lines) a, b, show the triangular retainers cut in the dentine of the linguo-gingival and labio-gingival angles of the cavity; (the dotted line) c, show a slight undercut in the dentine of the incisal angle (not a pit); d, e, the linguo-gingival and labio-gingival enamel margin cut in short curves and carried well to the labial and lingual for protection; f, enamel margin of the incisal angle; g, the gingival margin and wall; h, labial margin and wall; i, lingual margin and wall.

Figs. 6, 7. Represent a mesio-incisal cavity of class 2, division B, with a filling such as would fit in it. The letters a, b, c, f, g, and h, Fig. 7, represent the parts of the filling to fit in the corresponding parts of the cavity indicated by the same letters a, b, c, f, g and h, Fig. 6. Fig. 6

(the dotted lines) a, b, show the triangular retainers cut in the dentine of the linguo-gingival and labio-gingival angles of the cavity; c shows a shallow labial step; d and e the short curves on which the labial and lingual margins unite with the gingival; f, the lingual step or seat; g (dotted lines) shows a groove with square ends cut in the dentine two-thirds the length of the lingual step; h, the labial plate of enamel, supported by dentine; i, the gingival margin and wall or seat of the cavity.

Figs. 8 and 9. Represent a mesio-incisal cavity of class 2, division B, with a filling such as would fit it. The letters a, b, c, Fig. 9, represent the parts of the filling to fit in the corresponding parts of the cavity indicated by the same letters a, b, c, Fig. 8.

Fig 8 (the dotted lines), a, b, triangular retainers; c, dovetail cut on the lingual surface; d, the gingival wall or seat of the cavity; e, f, short curves uniting the labial and lingual margins with the gingival.

Fig. 10. Represents a mesio-occlusal cavity class 3, as seen from the mesial surface of a superior first molar; a, gingival wall or seat; b, occlusal step or dovetail retainer; c, lingual wall; d, buccal wall; e, axial wall; l, l, slight undercuts in the dentine of the bucco-gingival and linguo-gingival angles of the cavity to facilitate the starting of a gold filling.

Fig. 11. Filling removed from the cavity, shown in Fig. 10, a, gingival margin; b, dovetail retainer on the occlusal surface; c, lingual margin; d, buccal margin.

Fig. 12. Shows the occlusal surfaces and point of proximate contact of the superior first molar and second bicuspid, also an occlusal view of the mesio-occlusal cavity shown in Fig. 10, a, gingival wall or seat; b, occlusal step; c, lingual wall; d, buccal wall; e, axial wall; (dotted lines) f, shows the outline of the retention on the occlusal surface when the disto-lingual groove is included in the cavity; (dotted line) g, a cavity in which the buccal margin (i) and the lingual margin (j) have not been cut to a self-cleansing point; (dotted line) k, shows the contour of a finished filling.

CLASS 1 {
All cavities
on any sur-
face other
than proxi-
male.

Rules for Preparation.

Illustrated in Figs. 1 and 2.

Extend the margins to meet the requirements of Rules 1, 2 and 3.

RETENTION :— Slight undercut in the dentine all around the cavity, or in at least two of the walls which oppose each other, Best made with a small inverted cone bur.

BEVEL OF THE MARGINAL EDGE :—Should be obtuse; five to ten degrees.

Rules for Preparation.

Illustrated in Figs. 3 and 4.

Extend the margins to meet the requirements of Rules 1, 2, 3, 4 and 6.

RETENTION AND BEVEL OF THE MARGINAL EDGE :—Same as for Div. A.

A :—Cavities arising from structural imperfections in pits or fissures

B :—Cavities on labial, buccal or lingual surfaces, caused by contact with secretions from diseased tissue, or the product of fermentation

Rules for Preparation of Class 2, Div. A.

Illustrated in Figs. 6 and 7.

All margins should be extended to meet the requirements of Rules 1, 3 and 4. The labial margin *h*, should be extended labially sufficiently for direct access to all parts of the cavity and to permit the gold to reflect light. The lingual margin *i* should be cut to the proximo-lingual line angle. The gingival margin *g* should be located well beneath the gingiva, or in case of extensive recession, the margin should be cut to the widest part of the interproximal space so that it may be readily cleansed by the circulation of the saliva. The labio-lingual and labio-lingual enamel margins *d*, *e*, should be in short curves and situated well to the labial and to the lingual for protection. The enamel margin *f* of the incisal angle should be carried beyond the point of proximate contact. Much of the extension of margins can be made by cutting the marginal edges obtuse (bevel ten to thirty degrees) this is advisable in the situation of these margins as the enamel rods vary much from a line at right angles to the external surface of the tooth in cavities of this division.

RETENTION: Two triangular retainers, *a*, *b*, cut in the dentine of the linguo-lingual and labio-lingual angles. By reference to Fig. 5 it will be noticed that these retainers (indicated by dotted lines) continue as grooves along a portion of the lingual and labial wall, disappearing about the middle of their length. In the gingival wall *g*, the widening of the retainers *a*, *b*, stops or disappears at the center, labio-lingually. Under no circumstances should the gingival wall *g* be grooved across from labial to lingual as there would be great danger of the wall bulging out and checking at or near the center of its length when the gold is condensed into it, resulting in failure at a point difficult to detect. These retainers are opposed by a slight undercut *c* (shown by dotted lines) in the dentine of the incisal angle (not a pit). The axial wall should be left convex for protection of the pulp.

BEVEL OF THE MARGINAL EDGE:—Ten to thirty degrees.

Rules for Preparation of Class 2, Division B.

Illustrated in Figs. 6 and 7.

In cavities of this division be sure that you have enough space to restore full contour. Trim off the weak angle, extend the margins to meet the requirements of Rules 1, 3, 4, 5 and 7. The gingival wall or seat *i*, should be prepared according to Rules 1 and 2 for seat preparation. The labial and lingual enamel margins *d*, *e*, should join the gingival in short curves situated well to the labial and lingual for protection.

RETENTION: Two triangular retainers, *a*, *b*, prepared as described for division A of this class, except that in this division the retainers should be as large as the dentine of the tooth will permit. There is practically no labial and lingual wall as in cavities of division A, so that the grooves from the retainers continue toward the cutting edge in the axial wall; these grooves assist materially in building up the gold but do not offer much retention.

To most effectually resist the tipping strain, a flat step, *f*, is cut chiefly at the expense of the lingual surface, one-sixteenth to one-eighth of an inch deep from the cutting edge and about the same extent mesio-distally. From the extreme end a groove *g* (shown by dotted lines) is cut two thirds the length of this step (this must be in the dentine and should have square ends). A labial step, *c*, is now made with a smooth carbide wheel. This step should be deep enough to permit insertion of gold sufficiently thick to resist wear and the strain of occlusion and to protect the labial plate of enamel which must be supported by dentine.

BEVEL OF THE MARGINAL EDGE: Five to ten degrees.

In many teeth calling for cavities of this division the labio-lingual diameter of the incisal half of the crown is so reduced that it would be necessary to sacrifice too much of the lingual surface of the tooth to locate a step at this point and cut to the dentine. In these cases the cavity is prepared as shown in Figs. 8 and 9. A dovetail retainer, *c*, (instead of a lingual step) is cut slightly deeper than the enamel. This should be located as near the cutting edge as the tooth substance will permit, so as to have its bottom or axial wall in the dentine. The rest of the cavity and seat is prepared exactly the same as described in Fig. 6.

A:—Cavities which do not involve the mesial or distal angle.

B:—Cavities which involve the restoration of the mesial or distal angle.

CLASS 2
All cavities on the proximate surfaces of incisors and cuspids.

Rules for Preparation of Class 3.

Illustrated in Figs. 10, 11 and 12.

Extend the margins to meet the requirements of Rules 1, 2, 3, 4, 5 and 7. Join the buccal and lingual with the gingival in short curves to carry them as near a self-cleansing point as possible. The gingival wall *a*, with a step *b*, cut in the occlusal surface forms a substantial seat and is prepared as directed in Rules 1 and 2 of rules for seat preparation.

RETENTION :—A dovetail retainer *b*, is cut on the occlusal surface slightly deeper than the enamel, forming a step with the seat of the gingival wall *a*. This retainer should include all imperfections which may be found in the developmental grooves of the occlusal surface, and its diameter at the neck *h*, *h*, should be very little less than at its widest point. A slight undercut is made in the dentine of the bucco-lingual and linguo-lingual angles to facilitate the starting of the gold in filling.

In teeth in which both proximate surfaces are involved the cavities should be connected by a step extending from mesial to distal through the occlusal surface.

BEVEL OF THE MARGINAL EDGE :—Ten to fifteen degrees.

CLASS 3 { All cavities on the proximate surfaces of the bicuspid and molars.

THE FIRST INFERIOR MOLAR—PULPLESS.*

BY M. C. MARSHALL, D. D. S., ST. LOUIS, MO.

Fully informed that I am to turn loose the "dogs of war" upon myself for daring to announce as good practice certain ideas that have forced themselves upon me, it may appear reckless to proceed, with the mutterings of such a storm plainly audible. If our honest convictions will not stand the searchlight of investigations, they will naturally fall to that oblivion where they properly belong. Without discontent there is no progress. We as a profession have been discussing our differences of opinion for more than half a century; hence the proportions of the young giant of to-day, claiming all the rights and privileges of professional advancement. Has this been accomplished by negative processes, or by the fearless espousal of new thought presented for our consideration and held as valuable until the reverse has been proven true? The great body of the profession to-day is composed of shrewd, alert and wide-awake men, who grasp and apply practical ideas with avidity. While many operations and medicaments have been heralded abroad as meeting long-felt wants which have proven worthless and properly relegated to the forgotten, a sufficient number have proven valuable to revolutionize the practice, and must continue to do so until every avenue of failure is reduced to the minimum.

Being impressed with the frequent disastrous results attending the usual manner of treating, for instance the first inferior molar, with distal surface so badly broken down by caries that the pulp is hopelessly involved, I have sought means of obviating, first all the difficulty possible attending the treatment, and secondly the unfortunate results that so frequently follow the heretofore accepted practice. It is usual in such cases, to heroically cut across the grinding surface until the canal in the anterior root can be reached with more or less dissatisfaction. A too frequent result is a portion of a broach or Gates-Glidden drill left intra-neuros.

If, however, such is not done, we often feel that we would be glad to eradicate from our minds when dismissing our patients, a lurking suspicion that some day this tooth will demand more attention, possibly under more painful surroundings. If all are so

*Read before the St. Louis Dental Society.

fortunate as to successfully treat and fill this root, and can feel that all probability of pericemental irritation is eliminated, we cannot even then feel that a permanent operation has been performed.

The organic supply has been almost totally withdrawn from the parallel walls remaining, and their fracture is almost inevitable. If we could control this fracture to a point above the gum line it would be less calamitous, but unfortunately the majority of them carry away more or less of the root; so much indeed, sometimes, as we all know, that we cannot restore the member to usefulness with any degree of certainty. Hence I claim, that in the majority of such cases, the pulp being devitalized, it is best to cut the crown off, thus obtaining the best possible access for treating and filling this often complicated anterior root. Then by restoring the excised portion with a properly constructed crown we obtain for our operation a prognosis absolutely nonobtainable by any other operation.

The position here taken can be applied to all the molars in the mouth. There are exceptions made by great circumference and elasticity of the orbicularis oris, inorganic quality of the tooth, and favorable anatomical form of the roots of the same.

If my premise is erroneous, my deductions fall; if not, they are impregnable.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

DISCUSSION ON DR. ALLEN'S PAPER. (SEE PAGE 434.)

Dr. GEO. H. CUSHING, Chicago: I hardly know what to say in opening the discussion upon a paper of this character. The work Dr. Allen has done is one of great value, giving us information regarding many points which we have been in doubt about for a long time. One of these is the reason why the State of Illinois should have so small a number of members of the State Dental Society, thinking as we did that it was a very good society and ought to attract more members. After we have gotten the information it is easy to see that we have innumerable difficulties to meet; but the question how to overcome them is a problem that I think will puzzle us for some time to come. The classes of men that the report reveals to us as composing part of the profession

are very various. There are some of them it would seem to be useless to talk about, or attempt to get into the fold. For instance the gentleman whose dignity was so terribly shocked because he had expected to have a special invitation to become a member of this society, and to be received with a band of music, etc. He must have been a very precious article, and will probably be safely cared for by himself, and we should not hope for any great benefit if he were here. There are a good many other gentlemen who have been thirty-five years in practice and claim to know it all. We would not expect to get much information from such men if they became members, because they would keep all of their knowledge to themselves. It is useless for us to hope for any good from this class of men. But there is a large proportion of those who have expressed adverse criticisms, or given us the reasons why they have not become members of this society who, if they could be approached in the right way and by the right men, would become valuable members. There is no doubt of that in my mind, but to say how we have to reach those men is a difficult matter. There are very few who are not open to reason and to influence in the right direction, when it is brought to bear upon them by the right men.

There was much said in the address of the president with reference to influencing individuals and coming together in fellowship. That is one of the ways in which we are going to accomplish something if we accomplish anything at all. Perhaps it is the best way. I think it is. But how to form a fellowship with some of these men is a question. In some places they can be brought together in the manner spoken of by the president, after the manner of the Streater Fellowship Club. There are few communities in which these influences cannot be brought to bear on individuals. These men must be induced to take an interest in subjects of this character. It is astonishing to see so much indifference and ignorance on part of the profession at large with regard to dental societies. One of the gentlemen said that he did not know Dr. Allen. He wanted information as to what were the purposes of this society—what were its objects. That man must have a vast amount of ignorance when he cannot conceive what a dental society is for. I cannot offer any suggestion other than that offered by the president regarding the matter of fellowship clubs,

brought about in the way he intimated. There is one point to which I want to call attention. The impression seems to be conveyed by the president's address that we are not doing as well as other people; that the profession and the State society are not doing as well as the societies in other States. That I think will be found to be a very great mistake. I am told by Dr. Ottofy that, as compared with New York, we have about the same number of members.

Dr. OTTOFY: New York's State society has a hundred and fifty-one members and we have a hundred and ninety-three, although in New York State there is a vastly greater number of dentists. Pennsylvania's State society membership is smaller.

Dr. CUSHING: The number of members belonging to our State society is equal to the number of members of the American Dental Association, which is our national organization. I think we have the same number exactly, so that you see we are not behind. However, this is no excuse for our not having more members, but we are doing as well as other parts of the country, and we believe and claim that our professional standing, our interests and aspirations are as high as those of any other State.

I want to make one reference to an impression which the president's address gave this morning, namely, with reference to the limited influence of the State society. He quoted the number of members, but he forgot to state how many members there were and had been from the organization of the society. There are a large number of men who joined and have ceased to be members, and it must not be forgotten that these men have had the good influence of the society for whatever time they were connected with it. There have been about four hundred and thirty all told from the organization who have joined this society, and to-day we have a hundred and ninety-three members. They are constantly coming and going in that way. Some are dropping out, others join and only remain for a little while. The influence has been more far reaching than has been conveyed by the president's address, because there has been a larger membership. I do not know how we are going to stir up the profession as a whole unless we can get a dental Moody. We want an evangelist to go about and move the profession, make them cry and laugh and stir their enthusiasm. Until we get something of that sort I do not know how to reach these men except in a small way by fellowship gath-

erings. If we had a strong man, who had the magnetism to go out and talk to the profession, we might do much good. We would have to keep him at it steadily and start a revival, so to speak. Until we take an active interest in these things we are not going to accomplish very much. I am satisfied we can do more than we have done—many of us. We must realize the fact that we are sometimes lukewarm in the matter, and that more could be accomplished if we felt that we ought to talk to every brother practitioner that we meet and stir him up, and thus stimulate him to take an active interest in the profession at large.

Dr. J. G. REID, Chicago: A word or two in reference to a point made by Dr. Allen. Opposition seems to have been offered by some one who has been a member of the executive committee. I am speaking from my own standpoint. I say it with great pleasure and pride, not only for myself but for the members of this society, that I have never approached a man by letter or otherwise for assistance in making up this program who has declined. I have not with but one exception received a letter to the contrary. Personally, it has been a pleasure to me to get up this program, and I could not consistently with my knowledge and information make any such objections as were stated in Dr. Allen's paper.

Dr. T. W. PRITCHETT, White Hall: I did not hear all of the remarks made by Dr. Reid, but I caught a word or two in reference to some objections that had been made by some as quoted by Dr. Allen with reference to selecting clinicians, that they should be the favorite and best known ones, and all of that sort of thing. I wish to say, so far as the organization of the clinics this year is concerned, I sent out personal invitations from the beginning outside of Chicago, and more particularly to members who had been for some years connected with the society, but who had not taken a prominent part in its proceedings. I did this to give them an opportunity to accept or reject. I pursued this course mainly throughout all my work in making up the program of clinics. I make this explanation in order to show that no favoritism has been shown, but I have endeavored to give those men who have not previously taken a prominent part in our work an opportunity to accept places as clinicians. Some of the answers I received were courteously worded, and some of them said in a pleasant way that they had not been asked to give clinics before.

Dr. LOUIS OTTOFY, Chicago: This investigation of Dr. Allen

grows out of the fact that the membership of the society has increased, but slightly during the last ten years. There has been practically no growth during the last ten years; the net increase being about three members per annum. The inquiry instituted by Dr. Allen cannot help but result in good. The men who are going to become members of this State society are the ones who did not answer the doctor's circular letter. The replies to the circular came from the men who will never come to the society, who are not the right kind of men. The men who have not answered the circular do not want to state their reasons, and these reasons are in all probability financial considerations. There is no necessity in writing them as it is not going to help things any. I have no doubt there are many gentlemen who would like to come and join the society, but cannot afford it. These men we have not heard from, but they will be with us by and by.

There is also a misconception of the number of dentists in the State. I have heard it placed all the way from two thousand to twenty-five hundred. The S. S. White Dental Co. has probably the most complete list of dentists in the State, and I am told they have eight hundred and eighty-three dentists in this State outside of Chicago. I tried to get a look at the list of the new directory for 1897 that is to appear in Chicago, but they would not let me see it. I am informed that there are about eight hundred in Chicago. We must eliminate a large number of men who would never join this society, to whom it is useless to appeal at the present time. The number of Chicago dentists who attend society meetings is between two hundred and fifty and three hundred. Of the five dental societies in Chicago, some of the members belong to one or two, and some of them to three and four societies. Out of the eight hundred dentists in Chicago we may safely say that there are only two hundred and fifty who belong to societies. There is no reason why every one of those men should not come in here. The proportionate membership from Chicago is larger than that from the country, and consequently the objection sometimes raised that Chicago men run the society, is simply a natural condition of affairs. They number nearly one-half and if they are here they must take an active part. The country members can do much to get rid of that feeling by joining the State society, in larger numbers.

I do not see any ground for objections to the character of the

work done by the society. I think our society has done what no other State society has ever accomplished. It has generally made up its program from its own members. Our papers are prepared and read as a rule, with rare exceptions, by the men who live and practice in this State. Once in a while we have invited some one from outside of the State to read a paper or give a demonstration and paid their expenses, and at the same time we have felt that as good papers or better could have been read by some of our own members. I regret that although I have been a member of the society for sixteen years, I do not remember of bringing any one into the society. I have talked to a great many and urged them to join the society.

Dr. Taylor brought with him two or three men who came with the avowed purpose of joining the society. I think each of us should endeavor to secure a member for the State society, even if we have to pay his expenses.

A remark has been made that some of the gentlemen did not come because they had not received an invitation. I can see some cause for a feeling of soreness on that score. I thought when I joined the society that I ought have an invitation to do so. It might be a good plan if the Secretary had a circular letter printed placing them at the disposal of members to be used as a personal invitation to dentists to join. The program is an invitation, but it is not generally so considered. I have sometimes thought we could improve and enlarge the society by having a meeting in Chicago. The society has not met in Chicago for the last twenty-five years. Of the men who joined at that time, seven are in good standing today. The effect of the Chicago meeting was good. I do not know how many men would come in to stay, and it would be simply an experiment.

But there is a bright side as well. After looking at other organizations, I am proud to say that the Illinois State Dental Society has held not only its own, but more than its own. Social organizations in which men are continually dropping out, have gone down, all organizations having suffered during the past five years. The only organizations that can be said to flourish are bicycle organizations, and even some of them have gone down. Many social clubs have lost heavily in membership. We have not only held our own, but have gradually, though slowly, gained in membership.

Dr. J. G. REID, Chicago: Gentlemen asked me when I came

into the room what I had to suggest toward increasing the membership of this society. I answered him by saying, bring a man yourself. I said I have gotten three, and I can pledge myself to get a man here next year, and if every member would agree to pledge himself to bring a man here, you will double the membership of the society at the next meeting. I do not believe we have a member here but what has sufficient influence to impress upon a man the importance and value and the advantages to be gained from joining this society.

Dr. J. A. W. DAVIS, Galesburg : What about the requirements for coming into this society? Shall the candidate be a church member, a man who never touches whisky or beer? Must he be a member of the Masonic order?

Dr. EDMUND NOYES, Chicago : He must be a decent sort of dentist. That is the theory on which we proceed, and we act up to it as closely as we can. That is the standard, and I think every board of dental examiners will strive to maintain it. We need nothing further than that. Several men have made the objection that they have not been invited to come into the State society. There are two things opposed to that. Why should a man be invited to join such an organization as a State dental society any more than he should be invited to go into a dental college as a student if he wants to study dentistry? It is a thing he should do because it is to his advantage to do it. It is a part of his education. He should seek, and not wait to be sought. The next point is with reference to this announcement in the program. Something like it has been announced ever since I have been a member, and a copy of the program is sent to every dentist in the State. No man can reasonably say that he has not received a sufficient invitation to join this society. It is an absurd contention.

It seems to me, one or two words more should be said relative to the question which was to a slight extent under discussion this morning, namely, the exclusion of outsiders from our clinics; I mean all practitioners in the State who do not belong to the society. In respect to all of our proceedings, except the clinics, there is the same reason for open handed hospitality that there is for the generous publication of our transactions. An assembly room can be gotten large enough for all who wish to come to hear papers and listen to discussions. There is no reason in the world why every dentist should not come in yearly and listen to these

papers; but the number who can see the clinics is strictly limited, and the reason why outsiders who have no right there should be excluded is because every outsider who sees a clinic absolutely excludes some man who has a right to be there.

Dr. C. R. TAYLOR, Streator: With regard to there being about 2,000 dentists in the State, I will say that I got my information from Dr. Allen and the S. S. White Company. Its manager wrote to me that the number was between 1,900 and 2,000, not counting the recent graduates of colleges who have started to practice in the State this spring. There is some discrepancy in the information we have received here this afternoon. In my address this morning, in speaking of there being about four hundred dentists when this society was organized, I am very much in doubt about there having been that many, but it was the best information I could get on the subject. The S. S. White Company could not give definite information from the fact that they had lost their records of dentists in the State through the great Chicago fire that had occurred years ago.

Dr. ALLEN (closing the discussion): In reference to what has been said about the refusal to give clinics, I secured the information from Dr. Johnston's report a few years ago, when he said it was the most difficult thing to get anybody from the country to give clinics, and that finally he had to call on the Chicago members for assistance in making up that portion of the program.

DISCUSSION ON DR. HARPER'S PAPER.

Dr. C. B. ROHLAND, Alton: When Dr. Harper kindly showed me his models, and I grasped the significance of his admirable system and saw the clear and logical presentation of his subject as exemplified in these rules, I was simply lost in admiration; and since I have heard him here at greater length, I am free to confess I have not yet gotten over it. This is the best, and I may say the only real, logical, scientific presentation of this subject that I have ever seen or heard in any society. It is a subject that only lately has received the attention it deserves, and it is singular that we as a profession should have groped along so many years without any very definite or scientific methods for the proper preparation of cavities. In a general way, of course, its importance has always been recognized; but what proper preparation meant then is an entirely different thing from what it means now, for it is only

within the past six or eight years that the principles have been formulated which evidently furnish the inspiration to this very able paper of Dr. Harper's, and which he so gracefully, though too modestly, has acknowledged in the quotation, that he has simply "brought together here a nosegay of flowers, to which I have added nothing but simply the string that binds it together." I think we will all admit that he has done more than that. At least the string he has furnished is not the least important part of the nosegay.

Before this time our conception of our full duty in the preparation of a cavity was thought to be accomplished when the affected tissue was all removed, sound margin reached and the cavity shaped to retain the filling. The "causes of failure" in our fillings was always a favorite subject with our speakers and essayists; and the reasons usually given were lack of thoroughness in the preparation of the cavity, and faulty manipulation of the filling material. The cervical and adjacent margins were always recognized as the danger points in proximal fillings, and much time and thought were expended in devising methods to overcome the difficulties of reaching these situations and insuring the perfect adaptation of the filling material. One operator would use "soft" gold in these places, another would cure the trouble with tin and gold, another advocated amalgam and gold; all having but the one idea of securing perfect adaptation of filling material in order to render these points absolutely safe. I well remember one speaker, in order to illustrate the fallacy of filling approximal cavities at the cervical margin with cohesive gold, bringing before the society two centrals which he claimed he had extracted but a short time before. He said they had been filled by an operator of known ability, some ten years previously, with cohesive gold. "Now," said he, pointing triumphantly to decay which was making its appearance at the cervical margins of both fillings, "you see how impossible to perfectly adapt cohesive gold to these margins. Had these teeth been filled with soft gold they would have been good to-day." In this particular case the length of time and amount of decay alone disproved "imperfect adaptation," and it never occurred to him that the sole cause of failure lay in the failure to apply the doctrine of extension for prevention. The idea of extending margins beyond danger lines to prevent failures was never broached in all my reading or hearing until our

own incomparable Black gave to his students and the profession his theory of "extension for prevention;" and it was not until that time, and until his series of articles appeared on the proper management of the enamel margin, that the preparation of cavities was put upon something approximating a scientific basis.

As far as I understand Dr. Harper's rules and methods, I do not take issue with him on any material point; and on that account, and on account of the great importance of the subject, I have approached the discussion of it with considerable diffidence. When one thoroughly agrees with all the material points made, all that is left is simply to endorse what has been said; and when a subject has been so thoroughly, so logically and lucidly presented, endorsing all the points that might be considered worthy of emphasis would simply be repeating the entire paper. His classification of cavities I consider admirable, and his rules are based on sound mechanical principles. To my mind they are beyond dispute, and do not admit of argument. The only point I can see for legitimate difference of opinion is on the extent of their practical application. There are no rules, no methods that will admit of universal application. Cases may present themselves in which the conditions are such that one operator might feel a strict application of the rules would be unwise, while another would consider the reasons contraindicating insufficient. Here there may be quite a difference of opinion. That I admit the soundness of Rule 3, for instance, does not imply by any means that I shall in all cases rigidly follow that rule. I can conceive of conditions that in my judgment might even make the rigid following out of this rule bad practice. But we must have some ideal to work up to, and we must then recognize the fact that just so far as we depart from that ideal, so far do we run the risk of future disaster.

I have nothing further to say on this subject except to emphasize its importance. Heretofore we have spent a great deal of time studying how to manipulate our filling materials, and our advance has certainly been greater in that direction than in this; and it is only lately that, as I have said, this matter has taken form and shape approximately scientific. The subject is worthy our most careful consideration, not only while the doctor is talking so interestingly and exhibiting his beautiful models here, but at home in our offices and laboratories. By painstaking study and practice along the lines laid down by Dr. Harper, we will, I

am sure, make greater advances in the saving of teeth than we have ever done before.

Dr. C. N. JOHNSON, Chicago: I feel a great deal as Dr. Rohland did when he said that the subject was completely covered by the essayist, and there were no points with which to disagree. I believe it is one of the most systematic, most scientific presentations of this subject that we have ever had, and these models in the demonstration have carried our ideas very closely home. I read a paper on this subject myself last week, namely, the management of proximal cavities in molars and bicuspid. There is one point in this cavity here (illustrating) that I wish to speak about particularly, and that is the formation of the buccal and lingual walls. As represented in the model and as advocated by the essayist, these walls slope invariably in this direction, sloping from the axial wall, leaving the axial wall much narrower than at the enamel margin. I differ slightly in my preparation of these cavities from that form of these walls. I believe if it is possible to get some retention along these walls we will have a safer filling with that retention than without it. With this form of retention we depend entirely upon the strength of the filling as it approaches the occlusal step. If the filling stretches at this point from continued impact in mastication it causes a leak along the buccal and lingual walls which sooner or later will result in failure. The essayist advocated a strong filling at this point, as the proximal portion of the filling approaches the occlusal step, to prevent failure, but we are not always enabled, especially in some forms of bicuspid, to get a sufficient bulk of the filling at that point to be sure it will stand the stress of mastication. In these cases where the triangular ridges of enamel on the cusps approach each other in such a way, that in order to get a broad seat we must drill under them and weaken them, I do not extend the cavity to where the essayist does at that point. In molars it may be done, but not always in bicuspid. Where it is necessary to leave this portion of the filling more or less narrow, on account of danger of weakening the buccal and lingual cusps, in order to make the filling safe we must depend somewhat upon anchorage along the buccal and lingual walls. I believe greater solidity and greater security of the filling can be had, not by deep grooving, because I am opposed to it, as it has all of the faults spoken of, but by making the walls more nearly parallel and sometimes extending them so that the width of the

axial wall is slightly greater than the width at the inner margin of of enamel at this point. We may do this in many instances without weakening the walls perceptibly, and in that form of cavity preparation we have the filling dove-tailed into place. We all know a great many fillings stand the test of years which simply depend for anchorage along the buccal and lingual walls alone, without any anchorage step at all. A case occasionally comes to me, and especially on the first lower bicuspid, where I have to depend for anchorage along these walls rather than to extend the cavity in the occlusal step.

We have in the lower first bicuspids the enamel on buccal cusp meeting the enamel on the lingual cusp, the latter being short, and perfect union of enamel between these cusps. It is not an element of strength to cut through the enamel and weaken the tooth. In some instances anchorage may be gained along the buccal and lingual walls for retention of the filling. The form of the filling should be such that the marginal ridge is not reproduced. Fillings in the first bicuspids especially should slope in such a manner that the cusp of the opposite tooth has a tendency to force the filling into the cavity against the axial wall.

As to this whole question of anchoring fillings we shall work more intelligently when we subject each one of our patients to tests as to the force of mastication in that mouth.

Take a slim girl, who has apparently not much muscular power, and put a filling in her mouth, it is sometimes astonishing the force of mastication wrought upon that filling. It is of course best to anchor our filling as securely as possible, with safety to the tooth, and we should take advantage of every means to make it as firm as possible, even to retaining it between the buccal and lingual walls.

Just one other point. I am sure, that if this paper had been presented to a great many dental societies, it would have been condemned almost in toto, because of the radical measures advocated, but I do not believe they are any too radical. I think we have to acknowledge in all operations upon the teeth that we are not always able to live up to the ideal, but that the nearer we approach the ideal the more permanent will be our work.

The instrumentation of this subject is important, so much so as to call for a paper in itself. The doctor has covered so much ground that he has not gone into many of the details connected

with this work. In the preparation of every one of these cavities there is material enough for a paper, and the method of instrumentation is one of the most important things in the consideration of this subject.

I commend the use of the technical terms he has employed. He has used definite terms throughout the presentation of his paper. He has not made use of one wrong term in the discussion of the whole subject, showing that he has thoroughly studied its nomenclature. He has followed a definite method of nomenclature from beginning to end, so far as the principles are laid down. I agree with him in toto with the exceptions I have made, and I think the society may well congratulate itself upon listening to a paper of this kind.

Dr. C. B. ROHLAND : I desire to ask Dr. Johnson a question. He speaks of sloping the surface of the filling at this margin. If the filling is sloped, and supposing there is a proximal filling in the other tooth, it makes a V-shaped sort of space. Now, what will prevent the tendency of crowding of food down into that space, thus spreading the teeth? Supposing, for instance, one tooth is unsupported, what will prevent crowding of the food down so as to spread the teeth apart and let the food get between the interproximate space?

Dr. C. N. JOHNSON : If we have a small contact point, let it be located here (illustrating), that far down we will say, the actual area of that contact point should be so narrow that nothing can be caught between these teeth. Supposing we have a fiber of meat caught between the teeth (and they can never be held so tightly together that at some time or other the food will not be forced between them), if we have a broad contact point, it will be held there to decompose and decay, but where we have a narrow contact point, the food, if forced between, is carried away and not retained, provided the gum comes up and fills the interproximate space.

So far as wedging teeth apart is concerned, there is no more tendency with that form of sloping filling in this way than there is in any other form of contact, because the food coming between the teeth is not retained.

Dr. C. B. ROHLAND : They would not be forced apart if one were unsupported.

Dr. C. N. JOHNSON : That would occur anyway with any kind

of contact point. If one tooth is supported laterally the tendency is to move away from the other tooth.

I want to say a word in this connection in reference to the paper read by Dr. Black before the Chicago Dental Society at the annual clinic last winter, in which this term "marble contact point" was used. The impression upon many who listened to Dr. Black's paper was that he advocated a surface like the surface of a marble, whereby the contact point sloped away in either direction in the form of a sphere. I do not believe Dr. Black intended to convey any such idea as that. What he did say was that the area of the contact point between teeth was ordinarily not any greater than when two marbles were held together. If there are any here who listened to that paper and had such an impression, I want to correct it now, because I am sure they are mistaken. I have consulted Dr. Black since he read the paper, and the impression that has generally gone out that he advocates the proximate surface of a filling to be made like the surface of a marble, is a wrong impression.

Dr. T. W. PRICHETT: Bucco-lingually rather.

Dr. JOHNSON: Not even that. That would apply to the lower cuspid and first bicuspid, but not to molars.

Dr. G. NEWKIRK, Chicago: I am afraid a wrong impression is going to be conveyed in regard to the questions that have been asked and the discussion on this paper. This latter discussion grew out of what Dr. Johnson said with reference to exceptional cases, where, instead of going forward and making a step to support the filling he would depend upon grooves. But that method was limited mostly to the lower bicuspid, such a one as he showed me the other day in his office where that slope would naturally occur. If those present have gotten the impression that this is a general rule with him, it is a wrong one.

Dr. JOHNSON: I am glad Dr. Newkirk has corrected such an impression. I merely referred to the occasional cases where I believe it is necessary to anchor a filling in that way without going across on the occlusal surface. There is an element of retention in making a buccal and lingual wall of that form.

Dr. EDMUND NOYES, Chicago: I hesitate to say anything which would tend in any degree to modify or indicate exceptions to the rules and statements laid down in this paper. I have had too many unpleasant experiences or failures in my practice for

want of understanding and obeying these very rules. Notwithstanding that, I think that the old adage that all rules have some exceptions, holds true in regard to this also. It is very important that these scientific principles should stand clearly and definitely in our minds as the basis of all of our work, and if any exception is made to these rules, it should be with reference to just the particular thing we have got under our fingers, and for a very definite reason, just as we say sometimes that the first thing to think of in filling a tooth is to fill it with gold; if not with gold, fill it with something else for some positive reason which you can assign for not doing it with gold. These operations in bicuspid and molars are extensive; they take a good deal of time and prolonged and painful cutting to prepare the cavity, and it is a tedious operation to make a good filling. Sometimes we find proximate cavities in bicuspid and molars in children so young that it is a very serious matter whether they ought to be subjected to so severe and protracted operations, and I have felt justified myself in the results in certain cases where I have made such proximate fillings without cutting the occlusal surface at all, and the patients have had five or six years of good service out of teeth so filled, preventing the cavities from becoming deep, and I have been able to do more extensive operations when these people were old enough to endure them. This is one point that stands in my mind. There are a few instances, of incisors especially, in which the particular form and character of the teeth are such that for patients who will take scrupulous care of their teeth we may be justified in filling proximate cavities without cutting quite as much as to have the cervical border covered by gum tissue. I will say this, that I have had a very large and successful experience in making such fillings, and they have done excellent service and for such patients have shown no indications of failure. The same thing is true, in less frequent instances and with much more conservative care, in bicuspid and molars, many of which will be preserved permanently without extending the cavities to the gum line, or quite to the lingual or buccal wall, if the fillings go to the occlusal surface for good anchorage, and the buccal and lingual walls are some distance from the contact point. I do not want to say too much about these cases, because I have had some unpleasant experiences of failure along these lines; at the same time, I have seen enough of these operations that stayed year after year and showed no indications

of failure, to make me sure there are cases which will be permanently preserved without very extensive cutting toward the cervical, or buccal and lingual walls. I speak of this phase of the subject with a little care and hesitation, because the formation of rules and plans by the essayist seems to be the most thorough, the most scientific, the most certain of success and permanence of anything that we have ever had upon this subject, and as I said in the beginning, deviations from the rule should have definite reasons in the mind of the operator who dares to deviate from them.

Dr. E. H. ALLEN, Freeport: I am very much interested in this subject, and I was just thinking that here we have the preparation of this class of cavities reduced to a system. We have them classified, and while the preparation of this class of cavities is in some respects radically different from the lines I have followed, and I do not expect to go home and abandon all the methods of practice that I have used during the years I have been in practice; at the same time I see where I can change my methods in a great many respects with advantage. I never have attended a meeting of any dental society where I have heard a paper on this subject presented with so much clearness and with such good rules to guide me in the preparation of these cavities, as I have in this paper and the discussion which has followed. I feel that I am very greatly benefited by it. In a general way, in the preparation of the interproximate space and the margins of cavities, I have followed about the same way in my preparation of bicuspid and molar cavities.

Dr. J. E. NYMAN, Chicago: There is one feature in connection with this extension of margins and preparation of these cavities that has not been touched upon, that is, you are exposing the dentine of the tooth, you are exposing a larger area of it than was formerly done under old methods to a foreign substance, one which is a good conductor of thermal changes. It has been my experience, and perhaps the experience of others, that patients complain a great deal of the sensitiveness of these teeth to thermal changes, because we have this increased surface of sensitive dentine exposed to a foreign body, which is a good conductor of thermal changes. In the second place, we have an increased area of metallic surface, which intensifies the amount of thermal change according to the square of the increase of its area. It would be well in every case in which a great deal of sensitiveness is

present to flow a film of oxyphosphate of zinc cement over as large a surface of the exposed dentine as possible.

Then, there is another feature, namely, shape of the cavity and the shape of the tooth ought to harmonize. The contour lines of the teeth are all curves and so should be the margins of the cavities. In the preparation of certain cavities in the anterior teeth, as Dr. Harper has suggested, grinding the step at the occlusal surface of the incisor, this gives an appearance that is objectionable to most people, and unsightly to all. I should prefer in all such cases to place my reliance on the occlusal step in the lingual wall. It is seldom that we are not able to slightly grind the incisal edge of the lower incisor which occludes on the edge of the cavity. If we can do that, the danger of forcing it out of position is so much less that the anchorage on the lingual wall will be sufficient. If it is impossible to do that, I prefer to devitalize the teeth and put on a porcelain crown.

Dr. GEO. E. HUNT, Indianapolis: I believe that in the main the principles enunciated by the doctor in his paper are correct. But in preparing proximal cavities in the anterior teeth, I do not believe it is always necessary to cut the tooth substance below the gingival line in order to make a successful filling. I do believe that the margin of the cavity ought to be extended far enough away from the point of contact to insure a safe filling; but that does not always necessitate extending it below the gingival line. A great deal of excellent tooth substance would be sacrificed in always following that rule.

Dr. J. G. TEMPLETON, Pittsburgh: I agree in the main with the essayist; he has given us a beautiful demonstration of his method of preparing cavities. I wish to say a word or two in reference to the remarks made by Dr. Nyman concerning thermal changes, if it is permissible. For many years I have been in the habit of drying my cavities thoroughly and of cutting away freely, so that the marginal edge would be free without any contact, so as not to have the recurrence of decay. In order to prevent thermal changes I dry my cavities thoroughly with absolute alcohol, which has a great affinity for moisture, and after drying it I use bibulous paper or spunk, then varnishing the inside of the cavity, not allowing the varnish to go to the edge. I employ a solution of sandarac in sulphuric ether. The ether evaporates readily and leaves a thin coating over the inside of the cavity. If the cavity

is very deep, you can take a thin piece of asbestos felt and lay it in the floor of the cavity, put the filling over it and you will not have the effect of thermal changes.

Dr. THOMAS L. GILMER, Chicago: I wish to say a word or two which is somewhat foreign to the subject under consideration. It is with reference to the remarks made by Dr. Nyman when he spoke of using oxyphosphate. I made as a nonconductor under fillings, tests, a few years ago, to discover the relative conductivity of the different filling materials, and found that oxyphosphate was nearly, if not quite as good a conductor of heat and cold as condensed gold foil, consequently it is not a very good material to employ for this purpose. I believe Dr. Black says it is not good practice to use a medicament in a cavity, after it is prepared for filling, but experience leads me to the conclusion that if I use 95 per cent carbolic acid in a cavity and coagulate in a measure the contents of the tubuli, by that means, very materially decrease the effect of thermal changes on the sensitive dentine.

Dr. A. H. PECK, Chicago: I, like the majority of the preceding speakers, feel that we are under great and lasting obligations to the essayist for this complete, scientific and magnificent exposition of the subject with which he has favored us to-night. I also agree in the main with what has been said upon the subject. There are some points, however, with which I disagree, and the most essential one was that referred to by Dr. Johnson regarding the anchorage of large proximate fillings as indicated in this cavity (illustrating). In conversation with the essayist previous to the meeting, he told me that Dr. Black had examined his models, that he had looked carefully into the preparation of these cavities, and had stated that they conformed with his views in every particular. About two years ago I witnessed Dr. Black in his own office preparing cavities similar to these and filling them, and I must say, that his ideas regarding the preparation of such cavities have certainly changed since then, because the preparation of these margins, as he then prepared them, was altogether like the picture drawn by Dr. Johnson on the board.

This is the method which I have always practiced, and which I shall continue to practice, at least for a time, until such preparations as presented by the essayist, have had a more thorough trial, because I believe, as Dr. Johnson has said, that the force of mastication upon the filling at this point (illustrating) will

be found to be so great in the majority of cavities which contain proximate fillings as to loosen them along these lines and permit of leakage at this point. I may be wrong, but I believe I am right, and as I have already remarked, until this method has been further tried, I shall continue to prepare these cavities in the manner indicated by the drawings of Dr. Johnson. And I feel that there is certainly a mistake here as to the views of Dr. Black on this point.

Regarding the transmission of thermal changes, I endorse what Dr. Gilmer has said relative to phosphate of zinc and would go a step farther. I have had this experience, and doubtless you have had the same in large compound cavities, in bicuspid and molars, that after a filling of phosphate of zinc has been placed in the cavity the patient has suffered considerable pain from thermal changes. After the cement was absolutely removed and replaced with metallic fillings, with positively no lining between the metal and dentine, the patient has suffered no inconvenience whatever.

There is one other point in which I disagree with the essayist, and that is in connection with the preparation of the cavity of this incisor. This, however, is a matter of minor importance, but it is not long since that I opened the discussion on a paper read by Dr. Johnson in one of our local societies in which this very point was involved. We then agreed—I think we will now. You will remember the essayist stated that in incisor teeth, especially those that are very thin from the labial to the lingual aspect, he would not advocate extension of the cavity as indicated here, but would rather leave that part intact and make retention by this step farther down on the lingual surface. The idea of a step at any point is to impart strength to the filling at the incisal edge. At any rate, that is where that portion of the filling needs support, if at any point.

How is it possible to impart additional strength to this portion of the filling, if we build up extension at this point, leaving that portion of the filling to rest upon a flat even surface from that point to the incisal edge. In the teeth referred to by the essayist, it leaves a thin portion of filling material, one which is incapable of withstanding any considerable force at the incisal edge, and I believe in such cases as those failure will be the invariable result; so that instead of obtaining anchorage, as indicated by that outline, if necessary, I would go so far as to cut both labial and lingual

plates of enamel and restore them with filling material, extend the cavity across and gain anchorage in that way in order to obtain proper strength.

Dr. J. G. REID, Chicago: Referring to the preparation of cavities exhibited by Dr. Black in his clinic some two years ago, I will say that there is an old adage that a wise man changes his mind. Two years is quite a long time, and Dr. Black may have changed his mind during that time. He may have concluded that this is the correct way of preparing these cavities, and not so by the method he advocated at that time. It might be well to make this correction.

Dr. C. N. JOHNSON, Chicago: I cannot keep still. To-morrow or the next day at the clinic I shall show some cavities that were prepared by Dr. Black a few months ago, and then this question can be settled.

Just a word or two regarding sensitiveness to thermal changes after a filling has been inserted: Did it ever occur to any of you that this sensitiveness arises from the fact that we do not cut away enough tissue?

We have been in the habit of leaving partially decalcified dentine in the bottom of cavities through fear of approaching the pulp, and the conviction has been growing upon me of late that in doing this we often retain the very element in the cavity which causes sensitiveness to thermal changes. This infected tissue is abnormal and much more susceptible to impressions of all kinds than healthy dentine. It is irritable—we all recognize that—and I am inclined to believe that the thorough removal of this infected tissue will result in less sensitiveness after filling. At least that has been my clinical experience. Of late years I have been cutting my cavities more freely than formerly and I have not had the same complaint of sensitiveness. The penetrating effect of decay as illustrated recently by Dr. Williams is another argument in favor of thorough cutting. Of course I should not deliberately expose a pulp when there was anything like firm dentine over it, but I think a more complete removal of infected dentine will result in diminished sensitiveness.

Dr. IRA B. CRISSMAN, Chicago: I have watched with considerable interest the scientific demonstration of Dr. Harper, and have also listened very attentively to the remarks that have been made. In my practice I find one class of cases objectionable, name-

ly, where the cavity extends to the occlusal surface from the labial to the lingual, including the interproximate space. We will make the assertion that it is proper to retain the filling and that we should try to get perfect adaptation of the gold to the cavity in order to get a free cleansing surface to the labial and lingual sides. We take a great deal of time in excavating a cavity and filling it, and it is perfect; but how many patients appreciate the importance of taking care of their teeth after they have been filled. We know that as the saliva courses down the buccal and lingual sides the teeth are kept clean. In my practice, I find it very perplexing sometimes to do work for certain patients. For instance, I prepare and fill a cavity of this kind for a lady, and the first thing she does is to make a hairpin receiver of her mouth, comes back and says the filling dropped out. When I asked her how it came out, she will probably tell me that it came out of its own accord or while eating soft bread. It is all right for patients to come back and complain if we are to blame on account of improper work, but it is our duty as dentists to point out the importance of taking care of their teeth after they have been filled. I know this seems of little importance, nevertheless 'tis true, for they want us to reinsert the fillings the next time free of charge, knowing they are to blame.

Dr. E. K. BLAIR, Waverly: I do not wish to occupy the time of the society more than a moment or two. I have in my mouth a filling that was made within the last few months. It is a large proximal gold filling in a left lower first molar. I am happy to say that Dr. Black made it, and to morrow you can look at it at the clinic if you wish.

Dr. J. E. NYMAN, Chicago: I do not know what experiments Dr. Gilmer has made, but it is contrary to the laws of physics to say that any cement is as good a thermal conductor as a metallic substance. It has been demonstrated clinically by the majority of the profession that oxyphosphate in a cavity does not transmit thermal changes appreciably; whether this is because of a break in the homeogeneity of the mass of the filling material or not, I cannot say. I am certain that it is a very good protector against thermal changes.

In regard to varnishing cavities, very often in introducing pellets of gold you rub the varnish off of the dentine before you get the filling in. It rubs off in a kind of powder, a large part of

it falls out of the cavity, the rest of it on the surface of your gold and spoils its cohesiveness.

Dr. Johnson spokè of leaving infected material in cavities, and its causing sensitiveness to thermal changes and further decay. As I understand it, the paper did not refer to this phase of the question, but merely to an extension of the cavity in sound dentine for the purpose of preventing recurrence of decay; but I know perfectly well that some years ago the doctor advised leaving a portion of infected dentine in certain parts of the cavity, after having thoroughly disinfected it with antiseptics, in order to protect the pulp from thermal changes. I repeat, you are increasing the amount of metal in the tooth, consequently you are intensifying the amount of heat which would be conducted to the dentine of the tooth; and you must make some provision to prevent constant shock and ultimate death of the pulp.

Dr. E. K. BLAIR, Waverly: I meant to have spoken of one point when I was talking a short time ago, and it is this: I think the case in my mouth is a typical one. It illustrates what Dr. Harper has been talking about. It is the question of contact, of shape of these proximal cavities, and cutting a square seat for anchorage. It shows the proper filling of teeth in relation to the excursions of food. My mouth presents a good example. Dr. Black did not give me any great amount of pain in working on my tooth, and it was only sensitive to thermal changes for a few days. After a short time the tooth dropped back into its proper position, and from that day to this I have not had any trouble with a single bit of meat fiber between these teeth, and this tooth is scarcely susceptible to thermal changes. I looked at the operation with a glass as he did the work. It is my impression that he cut longitudinal grooves but slightly in the buccal and lingual walls.

Dr. R. N. LAWRENCE, Lincoln: My impression of Dr. Black's theory is that it is good, safe and conservative practice to cut away these margins until they are free from contact.

Dr. HARPER (closing the discussion): It is quite possible that the point referred to by Dr. Johnson, that of squaring the dentine in the buccal and lingual wall is correct, although I distinctly recollect Dr. Black stated that he left the buccal and lingual walls as shown in the model. He said that he was in the habit of making a slight undercut in the dentine of the buccal and lingual walls near the gingival wall, but he stated distinctly that this was

to facilitate the starting and building of the gold in filling and not for the retention of the filling. These undercuts as shown in the model were put in at his suggestion, although they may not be just as he would like them. It was only a month ago that he made these statements.

I certainly advocate the squaring up of these walls as Dr. Johnson has stated, in a few exceptional cases, as in the lower first bicuspid. In this tooth there is practically no lingual cusp, and the occlusal surface on the lingual side is very much reduced in size so that a step of sufficient depth and width could not be located on the occlusal surface, thus we are compelled to resort to retention in the seat and buccal and lingual walls by squaring out to the limit consistent with the strength of these walls.

In this paper it was intended to give general rules, although I recognized these exceptional cases, but thought they could be better considered under a separate title, as they in themselves would make a lengthy paper, and I did not want the exceptional case to be confounded with the general rules. (Here Dr. Harper replied to all of the points of criticism by referring to his various diagrams and models.)

DISCUSSION ON DR. YORK'S PAPER.

Dr J. E. HINKINS, Chicago: Dr. York was kind enough to present me with a copy of his paper two or three weeks ago.

After a careful study of this paper when it was handed me to read by the essayist, it pleased me very much indeed, with the originality of the work and the scientific manner in which he carried on his investigation. I was inclined to agree with Dr. Harlan's views until I read Dr. Kirk's paper two years ago, in which he brought out some scientific points quite plain in behalf of the coagulators of albumen. And then following his paper came Dr. Truman's paper with his numberless experiments showing and illustrating that they did penetrate dentinal tubuli, and from my own clinical experience, I began to draw my conclusions accordingly, from the best results obtained from the two different classes of remedies and noted the results of each, have come to the conclusion that coagulants are not self-limiting.

After reading Dr. York's paper carefully and then going to his office and watching him make all of the experiments, using the

utmost care in every detail to be sure that he had made no mistake, I must confess I was surprised to see the chemical results which followed every experiment he made.

The manner in which the sections were made with carbolic acid and fuchsin is conclusive in itself that carbolic acid does penetrate the dentinal tubuli. Whether or not the fuchsin aids the carbolic acid in its diffusibility or not I cannot say, but here comes the other experiments still stronger than ever. Here are teeth that have no cavity in them at all, the pulp extracted from the foramen and sealed perfectly with gutta-percha and washed in running water for hours and then suspended in water with their crowns downward and we see that carbolic acid does diffuse through the dentinal tubuli, and when he adds the bromine water you have seen the precipitate that it throws down.

We have been taught the coagulators form an insoluble albuminate and as we follow these experiments we come to where he has put sodium chloride in teeth where he has previously had carbolic acid for seventy hours, seals the teeth with gutta-percha and then suspends them in water as before. In less than three hours he adds nitrate of silver to the water and gets a very decided reaction of chloride of silver. It seems from the experiment that the carbolic acid had opened the tubuli instead of closing them up.

I have experimented on four teeth, one a perfect tooth just extracted, the other three had been extracted for some time. On the freshly extracted tooth I obtained the same result as Dr. York, testing for carbolic acid at ten and fifteen hours, no trace. At twenty hours found carbolic acid. The silver test was a decided success in this case, the three teeth having been extracted for some time. Found carbolic acid after sixty hours.

Now, gentlemen, these reactions are chemical facts and no guess work about it. They either combine specifically or they do not combine at all.

The egg test stands for itself. I have made this experiment and have obtained precisely the same results as the essayist has and I firmly believe any one else can obtain the same results if he conducts the same experiments on chemical principles.

The glass tubes demonstrate beyond doubt that the sealing was perfectly done as you have seen. There has not been the slightest sign of carbolic acid in the water where they have been for weeks and have been tested frequently.

The pathological part of this paper is an extremely important one and I must frankly confess that I am not competent to discuss this part of the paper as it should be.

Although I have lost no time since I first read the paper to obtain the scientific facts and to try and ascertain if possible what the real pathological conditions might be in a congested pulp whether or not it was due to the pathogenic microbes and the breaking down of the liquids and producing a putrescent pulp and then death, or was the death of the pulp caused by the formed substance of tissue elements in the cell and cellular structures, is the question I cannot answer from my own knowledge. But I have been taught from such men as Profs. Klebs and Stanger, Ziegler, Walsh and other prominent writers, that death was due to the chemical changes of the cell and cellular structures which would result in the death of the pulp or coagulative necrosis.

I shall quote Ziegler and leave the subject to you:

"A. Schmidt, in his work on the blood, published in 1892, therein he collects the results of many years of study on coagulation regards the fibrin ferment or 'thrombin' under the influence of certain zymoplastic substances. In the same way he regards the fibrinogenous substance, or metaglobulin, as a product of the disintegration of cellular protoplasm. If this view be correct, and if investigations of Wlassow find further corroboration, then the generators of coagulation, as well as those of thrombosis, must all be regarded as cellular derivatives, and it would then be particularly the red blood corpuscles which would be the source of the materials of coagulation.

"According to Corin, coagulation occurs in the blood after death only when the blood already contained ferment during life; and the extent of the coagulation is directly proportional to the amount of ferment present at the time of death. A further production of ferment does not occur after death; on the contrary, the vessel walls probably constitute a body inhibiting coagulation. Between the blood of those who have died suddenly (cases of strangulation) and that of those who have died more slowly, the difference is only relative, depending upon the amount of ferment present. No value can therefore be ascribed to the fluidity of the blood in the diagnosis of the mode of death.

"When exudate is present in a tissue, it may be absorbed in part by the tissue elements themselves, so that they swell up

and not rarely contain drops of fluid, which are ordinarily called vacuoles. There often occurs also, a complete dissolution of the tissue elements in the exudate, especially of the connective tissue cells, and not seldom also of the intercellular substance. In this way both brain and muscle tissue, as well as ordinary connective tissue, may be completely liquefied in the course of an inflammation.

“If dead cells become saturated with lymph containing fibrinogen, and fibrin ferment is formed, a coagulation may precede the liquefaction of the infiltrated tissue, in which case the cells are transformed partly into homogeneous masses without nuclei, and partly into granules and filaments.”

The cause of the so-called lame teeth in my own clinical experience has taught me to believe absolutely that imperfect root filling is the principal cause of these neuralgic troubles, and not septic matter stored up in the dentinal tubuli and cementum, setting up an inflammation of the peridental membrane after it has been treated with coagulants, it must pass out the root canal and through the apical foramen to produce these conditions.

After reading Dr. York's paper with me Dr. G. W. Cook thought he might test the antiseptic properties of carbolic acid by sealing the teeth up as suggested by Dr. York, and making plate cultures of the anthrax bacilli and plating out Nos. 1, 2 and 3, placing the tooth with carbolic acid in it in Plate No. 2 and carrying this experiment on with eight teeth, getting no growth in Plate No. 2 in which the tooth was; while on Plates No. 1 and 3 the colonies appeared in great numbers. After this he selected ten more teeth preparing in the same manner and making cultures of typhoid and hay bacillus and getting growths as before on three out of ten. To be sure there was no difficulty in sealing the teeth, he took a glass tube and placed in it about three minims of carbolic acid and sealed it as in the case of the teeth, placing it in Plate No. 2. In this case there was plenty of growths right up around the ends of the tubes. Every detail of these experiments has been carried on under perfect bacteriological methods.

He does not consider this report anything like complete, but it goes to show very conclusively that carbolic acid is an antiseptic even through the cementum of the tooth, and Dr. Cook hopes to carry this work to a more definite conclusion.

Dr. A. W. HARLAN, Chicago: I have listened to the paper

that has just been read and I have watched the experiments, and, I may say, that up to the time of coming into this room and hearing the paper read and seeing the experiments, I had no knowledge of the work that had been engaged in other than what was afforded by the program. It is hardly possible for me off-hand to take up the whole of his paper and discuss it at once, but I want to say that the last and most conclusive test that Dr. York submitted to us is the faultiest one of the lot, the one with reference to the placing of carbolic acid in half of a boiled egg, then testing the water later. To my mind that test is inconclusive, for the reason that bromine water itself would produce a similar appearance without the presence of carbolic acid at all. Furthermore, in the specimens that were sent around, the pale yellow precipitate, which is characteristic of the bromine test, was not present. The very best chemists state that bromine water will distinguish about 1-265,000th part of phenol in a solution. I will take Bloxam as my authority. The bromine test is stated to be one of the best qualitative and quantitative tests for phenol that we have. I have in my hand two specimens that are but ten days old, that have contained 95 per cent carbolic acid. The pulp was taken from a freshly extracted tooth May 1, 1897, and the root of this tooth was hermetically sealed and 95 per cent carbolic acid was added to it, and if it has gone through into the plaster of Paris, when that has broken up, it will show the same reaction that Dr. York's tests have.*

Dr. YORK: Yes, if they have been kept under the same conditions that my tests have. If kept in dry plaster, it would not get that. That is not the same condition we have in the mouth.

Dr. HARLAN (continuing): I have also two teeth that were treated in a similar way; they were filled with a solution of nitrate of silver, from 50 to 75 per cent. If the nitrate of silver has passed through into the plaster of Paris, we will determine later this afternoon by testing it a little. I only brought these with me, because I did not know what the character of the paper was to be, or what it was to deal with. It will show that nitrate of silver can easily be detected by a number of tests that are sufficiently plain for any one to see. As a rule, the test of Dr. York is absolutely inconclusive, for the reason that you cannot manufacture iodide of lime in the presence of magnesium and fluorin and other inorganic

*No reaction after sixteen days [EDITOR].

constituents of the tooth. Lugol's solution, or any other solution of iodine, in the presence of another coagulator, if you keep on adding it, would ultimately pass through and stain a tooth so that the characteristic blue reaction would take place. I am not here to repudiate the testimony and the experiments that have been made, extending over a long period; but, it seems to me, that the experiments, while very careful and ingenious, do not prove that in the mouth of the individual the same thing would take place. In talking to Dr. Black on this subject recently, he said that the thing lacking in all of these experiments was the restraining influence of the vital fluids and the surroundings which had a tendency to render the effects of the coagulating agent null and void. Now, if you take nitrate of silver, which is an excellent coagulating agent, and place it in a tooth in the mouth, and leave it there and afterward extract the tooth, you do not find it is blackened up to the cementum, because I have extracted such teeth. How long it takes to accomplish that, I do not know; but when nitrate of silver is brought in contact with organic matter it precipitates the free silver and on exposure to light or sunlight or a diffused light, the substance with which it has been brought in contact turns black. If one of the powerful coagulating agents in a tooth *in situ* has failed to pass through the dentine, I do not know how it would be possible for us to prove that carbolic acid would pass through dentine in the jaw, although perhaps some means will be determined to prove that.

The experiment with reference to the treatment of a tooth with carbolic acid and afterward with sodium chloride, I do not know just what reaction would take place between sodium chloride and carbolic acid. If any of the sodium chloride passes through it would be easy to recover it. Sodium chloride is not a medicinal agent, and I would not consider that this was a test of what is meant by a barrier to the diffusion of other medicinal agents. You take a tooth and seal the foramen and treat it with 95 per cent carbolic acid and leave it twenty-four, forty-eight, sixty or seventy hours, and introduce a solution of sodium chloride and suspend it in water, and then test for the precipitate of chloride of silver, I would hardly consider that this would be analogous to the situation of a tooth in the mouth, and I would not consider it to be conclusive when another medicinal agent was not barred from passing through the tooth.

I am sorry I did not have an opportunity of reading this paper and preparing myself for a more interesting discussion of it; but I shall take the opportunity to repeat a great many of these experiments myself, and if it shall be proven that the coagulating agents are not barriers to the diffusion of other medicinal agents, I shall simply take off my hat to any gentleman who proves it. (Applause.)

Dr. J. G. REID, Chicago: I have very little to say in connection with this subject. I have read the literature of it a great deal, and I am very much interested in it. We have this question to settle. It must and will be settled conclusively to every one in the not distant future. We will be able to say whether these agents are self limiting or whether they are not. We are getting very close to it. The experiments which have been conducted so far on both sides, I cannot take issue with; I cannot oppose either one side or the other. Personally, I have not investigated this matter by experiments. I have observed and seen the results that other men have demonstrated, and from these results I draw my conclusions. I believe that my clinical experience is worth something to me. I believe that my observation as a dentist, who tries to observe and learn from what he sees, is of benefit to me. We have all used carbolic acid for many years, many of you for thirty or forty years, and have had good results from it, and still continue its use. The father of antiseptic surgery has returned to his first love. I refer to Sir Joseph Lister. He was practically the first one who introduced antiseptic surgery, made it generally known, and has within the last four years made the statement that carbolic acid is par excellence as an agent in antiseptic surgery. All of us have used carbolic acid in the treatment of pulpless teeth. Understand me, I do not wish to convey the impression that this agent is the very best that can be used in pulpless teeth; carefully conducted experiments prove the contrary; there are other agents far more potent for this purpose.

With reference to the experiments that have been conducted, showing the diffusion of noncoagulating agents, while I believe they are thorough in the true sense of the word, and I am willing to accept the results. I am not willing to believe that some of the coagulating agents do not and will not diffuse through the dentine.

Dr. A. H. PECK, Chicago: The question under discussion, as I understand it, is not whether carbolic acid is a thorough, safe

antiseptic to tie to, but simply as to whether or not it will pass through the dentine of a tooth; whether or not it is a so-called self-limiting coagulant. As to its antiseptic properties, I think we shall be able to clear that up satisfactorily a little farther on.

First, I want to say to the members that I consider the work done by Dr. York along these lines the very best work that has been done in this connection. (Applause.) I consider Dr. York's series of experiments freer from faults than those of any one else of which I have any knowledge. I know that he has exercised the utmost care in carrying out every detail of this work. It seems to me, that the manner in which he has gone about this work ought to convince all of us who are fair minded, that the results he has arrived at are conclusive.

I wish to say also that within the past two or three weeks I have done considerable work in this same line myself, in an experimental way. Dr. York knew nothing about this, as I said nothing about it to any one, and knowing the methods which he has adopted in carrying out this work, I have done my work as far as I have gone with it in the same manner, because I was unable to work out any other method which would seem to be more complete or safer to adopt. My results, so far, coincide with Dr. York's exactly.

Regarding the antiseptic properties of carbolic acid, in connection with my college work during the past winter, and in conjunction with Professor Black, I made as complete a series of experiments as possible with the various essential oils and other agents ordinarily used in dental practice, with a view to determining their relative worth or potency as antiseptics. The manner in which we went about the work is this: Taking test tubes with sterilized broth, each one containing on an average 8 cc., this broth was infected with saliva from various members of the class, into which a certain quantity of the agents being used for experimentation was placed. For instance, after one tube had been infected, one drop of oil of cassia was placed in the tube; this in turn was placed in an incubator, and observation of the results was carried on for a period of three days in connection with each of the plants made; and altogether we made something over 200 different plants in order to arrive at the results which we did. In relation to carbolic acid, a 95 per cent solution was used. We first made a plant with one drop. The growth was restrained for

a time; at the end of the first twenty-four hours more or less bacteria developed. At the end of the second day, with one drop, there was a very great amount of growth, seemingly as much as appeared in the control tube, and the control tube was the one into which no antiseptic agent was placed; and in connection with each set of plants made a control tube was used, and invariably presented unlimited growth; hence there can be no doubt as to the accuracy of these experiments. I increased the carbolic acid up to 3 drops, and this restrained the growth in the tube until the end of the third day; after that growth set in, and there was more or less development of bacteria. We made a plant of 5 drops, and this restrained the growth for a little longer period. We continued this work until we decided that carbolic acid is not a safe, thorough, permanent antiseptic to use, that is, purely as an antiseptic. It has the peculiar property of restraining the development of bacteria for a time, but after a few days have elapsed it seems to lose that power, and the development of bacteria goes on just about the same as if no antiseptic were present.

A MEMBER: What was the result of oil of cassia?

Dr. PECK: One drop prevented growth.

Dr. J. W. WASSALL, Chicago: This is a question of very great interest and I suppose there are few members here who have not read almost all the articles that have been written on the subject. The experiments of Dr. York have apparently been more scientifically carried out than any that have heretofore been made, and a great many present to day seem to be convinced of the truth of the position he has taken. However, the question is not yet definitely decided, judging from the way Dr. Harlan speaks. The cases he exhibited just now show that he has conducted similar experiments, and it would be interesting to know whether he finds traces of carbolic acid in the plaster surrounding these teeth. The practical phase of this subject is whether carbolic acid is a good disinfectant. This question was raised by the essayist, and even if it is a good disinfectant, is there not a better disinfectant? It would seem to me from the investigations of Dr. Harlan that carbolic acid is a very poor disinfectant for this purpose; it would also seem so from what Dr. York has told us. What is the condition we find when we have used carbolic acid in a putrescent root? We have coagulated matter which remains in the tubuli. This matter is coagulated and for a time it remains innocuous and is no longer

poisonous to the tissues for the time being; but, as Dr. Peck has explained, this harmlessness does not last for a great length of time. You have all removed canal fillings that have been in the teeth for a number of years, and yet the odor of carbolic acid which was first used in these roots, has disappeared entirely. This also occurs in the tubuli of teeth where the roots have been filled and previously sterilized with carbolic acid. The carbolic acid finally disappears, leaving this coagulated matter in a condition where it can act as an irritant to the cementum. Here, at this point, I differ with Dr. York as to lame teeth. I have observed a great many lame teeth where there was no evidence of irritation at the apex of the root, where there was no fistulous opening, but there seemed to be a general lameness of the tooth in its socket. Such cases are relieved by opening up the teeth, removing the old canal filling which may be there, and thoroughly disinfecting the whole zone of dentine, which will be found to be polluted by septic matter. In such cases you will get very little or no discharge. You will find no moisture at the apex of the tooth, but you will find the dressing which is taken out of the tooth generally stained. I now wish to say a few words relative to the comparative value of the volatile oils and carbolic acid. I have spoken of the disadvantages of carbolic acid, and now wish to say a word about the use of volatile oils in the root canal, the dentine of which is polluted with putrefied organic matter, meaning by this the putrefied dentinal fibers. The treatment of such a root with volatile oils is more efficacious, because at the time you take out the dressing, which has been placed in the root for twenty-four hours, you will find there is a stain upon the dressing. This stain is the putrescent matter which has been extracted from the dentinal tubules. The volatile oil has acted as a solvent for this matter in the tubules and has withdrawn it, and of course the proper treatment is to keep on making dressings of volatile oil until no more stain is observed on the dressings. If you used carbolic acid you would coagulate the contents of the tubules; therefore, you could not extract this putrescent matter from it.

Dr. LOWRY, of Kansas City: Dr. Reid seems to have struck the keynote when he said that carbolic acid was the chief antiseptic, as stated by Sir Joseph Lister, and I agree with Lister on the subject. Carbolic acid, as we know, is a strong coagulant, and coagulation checks infiltration. Whenever you introduce it into

the root of a tooth it coagulates the protoplasm of the tubuli and prevents infiltration or penetration. You have not in it therefore the beneficial results that you would have with some agent that is more penetrating or diffusing.

I doubt very much whether the experiments conducted by the gentleman who read the paper will prove reliable tests. The moment you extract a tooth, you take from it a certain degree of moisture or coagulative matter which does not resist the penetrating influence of the carbolic acid like it would in the mouth. There is a continual throwing off of serum from the peridental membrane through the cementum and into the dentinal tubuli which would resist the penetrating influence of the carbolic acid. Therefore, I think these tests conducted out of the mouth are not as reliable as those conducted in the mouth, if it were possible to conduct such tests.

Dr. TRUMAN W. BROPHY, Chicago: Perhaps I would not have arisen to say anything upon this subject had I not been prompted to do so by the remarks of our friend in the rear of the house. He has made a statement here, which I think should be challenged regarding the application of some of the essential oils to the roots or canals of teeth. My friend Wassall made the same statement. I want to go on record, Mr. President, as saying that certain essential oils should never be applied to the canals of teeth. They are a positive injury to the teeth and to the surrounding tissue. Oil of cassia is one; there may be others. Clinical experience has proven beyond a question of doubt that oil of cassia is a substance which should never be put into the canal of a tooth.

Dr. CUSHING: Why?

Dr. BROPHY: Because it will penetrate not only every particle of the tooth structure and the organic matter contained therein, but it will penetrate every portion of the inorganic matter of the tooth, except the enamel, and pass through into the pericementum and produce pericementitis. It is true that carbolic acid will not penetrate through the dentine into the cementum. Proofs have been offered and experiments have been made repeatedly to show that carbolic acid will not pass through the dentine into the cementum. It has never been done I think. If any one can prove carbolic acid has never penetrated through the dentine into the cementum, and if any one here can show me that it will go through

the dentine of a tooth and pass through the cementum to the pericementum, I shall be glad to see him do it. If he cannot do it now let him come before the society next year and prove it if he can. He cannot do it. It cannot be done. It may seem a little ridiculous to make such a positive statement without having conducted experiments along this line, but the experiment we have had to-day will convince any reasonable person that my statements are true.

I want the gentlemen who may think I am wrong to prove it next year by experiments, and I will do as my friend Harlan said, take off my hat as soon as they do it. But no one has been able to do it yet. This question bearing upon the therapeutics of carbolic acid is one that will never disappear from the literature of our profession. In 1882 I came before this society and read a paper entitled "*Carbolic Acid and Creosote, Their Therapeutical Application to the Practice of Dentistry*," and on that occasion I proved to many of my friends, who claimed that creosote was an agent that would absolutely not injure the dentinal pulp, and that it should be used in preference to carbolic acid and was in every sense more desirable as a therapeutical agent than carbolic acid, that creosote was only carbolic acid of a crude kind. I obtained twenty-five samples of creosote from as many different drug stores in the city of Chicago, tested them, and found there was only one specimen that approached anything like creosote; all the rest of them were carbolic acid, yet we have been deceived into the belief that creosote was so much better than carbolic acid. We are all using carbolic acid substituted by druggists for creosote.

There is a great deal to be said on dental therapeutics. There are men in this room who have been practicing dentistry longer than forty years, and have been using carbolic acid and creosote during that period of time. They have been treating pulp canals with it; they have been treating fistulous openings leading from alveolar abscesses; they have pumped it through these openings for a period of twenty-five years and have cured those cases unless they were complicated by diseased bone, and yet they now claim with other people that carbolic acid is a bad thing to put in the canal of a tooth. This is the question at issue to-day, is it an agent that will do harm? These patients got well twenty-five years ago; the fistulous openings healed. In those days, when they had no flexible fillings they filled canals with gold and conse-

quently the work was imperfectly done. These flexible root canal fillings adapt themselves to the different conformations of the canal. Some practitioners have pretty nearly abandoned the use of carbolic acid. I mean, now and then, you will see a dentist who uses it and his patients get along just as well, and perhaps better. Others use other agents. These questions are of interest to us and will be, and now that the question has gotten to a point of importance, has reached the jumping off place, it has got to be settled. It is like treating exposed pulps. This was a question which occupied everybody's mind twenty years ago, but it is not discussed so much now. The profession have different views about these things. When a pulp is in a state of inflammation it is the end of it, and whoever tries to save it is going to get himself into trouble and his patient more. Of course, there are some exceptions.

I am glad Dr. York has read this valuable paper to the society. It is an excellent contribution to the literature of the subject. It stimulates us all to take hope, and those whose views are not in accord with those presented in the paper will be stimulated to take this matter up and prove that their positions are correct if they can.

Dr. C. N. JOHNSON, Chicago: I wish to correct one impression Dr. Brophy seems to have made. He made the statement that carbolic acid would not penetrate dentine. He did not mean to imply that, and I fear many of the members got the impression from the statement that carbolic acid would not penetrate into the dentine to the cementum. According to the experiments, carbolic acid does penetrate through the dentine to the cementum, but it goes no farther.

One word before I sit down, in commending the essayist for the line of work he has been engaged in, and the manner in which he has prosecuted that work. I wish to modify a little some remarks I made in discussing the president's address. I made the statement that I was in great fear that the tendency among our young men was not toward original investigation to the extent that it was among the men of previous decades. I think this meeting has very nearly demonstrated that I was in error, and I want to take it back. (Applause.) I am not familiar with the subject under discussion. I have not made any experiments along this line, but I look at it from the point of view of a general practitioner. What we want to get at is the truth; and I feel

sure from my personal acquaintance with the gentlemen who take opposite views that when the truth has been conclusively proven there will be a general shaking of hands, and a rejoicing all around.

Dr. TRUMAN W. BROPHY, Chicago: I am glad to hear Dr. Johnson's correction of my remarks. I did not intend to convey the impression that carbolic acid would not penetrate through the dentine. If I remember rightly, I said that it would not penetrate through the dentine and also through the cementum, or from the dentine through the cementum. Of course, it will penetrate through the dentine, go to the cementum, and there it will stop. Oil of cassia will go through it all, and it will not only do this, but it will discolor the tooth, and for that reason it should never be applied to a tooth canal. Carbolic acid will go through the dentine to the cementum and there it will stop, but it will never go through the pericementum and produce pericementitis.

Dr. J. E. HINKINS, Chicago: I want to say a few words more on this very important subject, and first to commend the work of the young men in the profession. I firmly believe that the time has come when we as a profession should know more about the pathology of dentistry. We are exceedingly lame in this regard. I am sorry to have to admit I do not know of one man in the dental profession who is competent as a pathologist to take the different kinds of pus that we have to deal with and give us the results of it with the microscope, and differentiate the varieties of pus. I believe the time has come for our dental colleges to create a chair and educate our young men in bacteriology, who shall familiarize themselves with the methods of pathological conditions which come before us.

I am somewhat surprised at the turn the discussion has taken. The members have been discussing the antiseptic properties of carbolic acid more than the subject of the paper.

Another point about the chloride of sodium does not seem to be clearly understood here. Carbolic acid, as you have been told, does penetrate the dentine. It penetrates through the dentinal tubuli of the tooth. After the carbolic acid has been in a tooth for sixty or seventy hours and then removed and the sodium chloride put in, it is not considered a diffusible agent, but simply to demonstrate it does penetrate the tubuli of the tooth. Then we add nitrate of silver, 25 per cent solution, to the water where the

tooth has been suspended and get insoluble chloride of silver, which is an absolute test that the chloride of sodium has penetrated the dentinal tubuli of the tooth.

Dr. W. A. STEVENS, Chicago: I desire to say a few words in relation to creosote and carbolic acid. There is no difference in commercial carbolic acid and creosote, and I will defy any one who is blindfolded, who takes a bottle of carbolic acid and a bottle of creosote, to tell the difference. I understand that pure creosote is an extract of one of the wood tars and not of the coal tars. One is an escharotic, and the other is not.

Dr. J. G. TEMPLETON: I have a word or two to say in reply to Dr. Stevens. He said there is no difference between commercial carbolic acid and commercial creosote. If I had some carbolic acid and some creosote here I would soon convince him that he is wrong by a simple test. If you take a drop of carbolic acid and one drop of collodion and mix the two together, you will have a beautiful looking jelly—a good thing for the toothache. Another test: Take one drop of pure beech wood creosote and one drop of collodion, and they will not form a gelatinous mass. Pure creosote and collodion will not form a jelly, while carbolic acid and collodion will.

Dr. STEVENS: Extract of coal tar is not creosote in any respect.

Dr. A. H. PECK: I intended to say a word or two regarding the pathological phase of this question while on my feet before, but it escaped my mind. I will give the views of Dr. Black on this point. He does not attribute putrefaction of the pulp to chemical changes at all, but contends that in all cases the dead tissue within the pulp chamber or root canal must be infected with bacteria before putrefaction sets in, before gases and odors form, and before pus forms. There are different ways or mediums through which the bacteria gain access to the canals of the teeth. Very frequently from external openings, cavities, and so forth, possibly quite as frequently through the medium of the circulation of the blood. He contends and teaches that the pus microbes are present in the blood, not always, but to a very great extent; also that the bacteria of putrefaction are not present in the blood to such an extent as are a great many of the other varieties, but after the pulps die, speaking especially of teeth in whose root canals there are no external openings, before the gases and odors

can form, the bacteria of putrefaction must be brought in contact with the dead tissue. The dead tissue lies there in a quiescent state until through some accident or otherwise the bacteria of putrefaction gain entrance to the blood, and are by it brought in contact with the dead tissue and the changes referred to take place.

Dr. Brophy has given us his experience regarding oil of cassia, and I must say that mine is precisely similar to his, and I go quite as far as he does when he made the statement that it should never be used in the treatment of pulpless teeth. There are other agents that will do the work quite as well which do not leave the bad results that oil of cassia does. The oil of cassia will not only produce tenderness and irritation in soft tissues, but if a small quantity is held in contact with soft tissue for any length of time it will produce a blister. This has been demonstrated more than once. There can be no doubt that in the vast majority of cases of pulpless teeth, that develop tenderness, whose soft parts about the roots become irritated—inflamed—in whose canals oil of cassia is being used, that said tenderness is directly due to the irritating effects of the oil. If some agent were used which is free from the irritating properties of cassia no trouble would result.

I have been requested to talk further on this subject, but I hesitate to do it, because I realize it is foreign to the matter under discussion.

Dr. TRUMAN W. BROPHY: I believe I made a statement about oil of cassia passing through the entire tooth structure. I should not have said that. I do not mean to convey the idea that it would go through the enamel, I meant the cementum and the dentine. While I am on my feet, I will say that my attention was first called to the marked brown discoloration of the teeth, which is due to the translucency of the enamel, caused by the oil of cassia, by Dr. A. H. Fuller, of St. Louis. He brought to my notice the fact that oil of cassia would produce brown discoloration of the tooth, and subsequent observations have convinced me that this is correct, and I have abandoned its use in tooth canals.

Dr. J. E. NYMAN: In the first place, I want to give one of the first mistakes I made when I began to practice dentistry. I do not think it is the custom of many people to exploit their mistakes before a dental society, but I think sometimes we are all wiser for hearing them. I remember that one of the first cases I had after graduation was an upper first bicuspid, in the root canal of which

was found a putrescent pulp. The tooth was still in a sore condition. I did not think it advisable to fill the root canal immediately. At first I used peroxide of hydrogen and then oil of cassia to dress it, and I believe I kept this up for eight or nine months, and really thought I was doing the best thing for the case. I thought there was a more or less putrefactive condition in that root canal which was causing the trouble. Finally the patient told me that she was discouraged, and thought she had better have the tooth out; and I had arrived at the same conclusion myself. I extracted the tooth for her, and found the pericementum very much inflamed. On holding it near the nose one could detect the oil of cassia very strongly. There was no sign of putrefaction or of suppuration about it anywhere, and I believe it was nothing but the irritant effect of the oil of cassia which resulted in that condition and necessitated the extraction of the tooth.

With reference to carbolic acid, a great many surgeons never use it at all. Another thing Dr. Reid spoke of was modern antiseptic surgery. Modern surgery is not antiseptic surgery at all, it is aseptic surgery. All the modern surgeon does is to boil his instruments and dry them with the evaporation of alcohol or chloroform. Dr. Graham and Dr. Senn have told me that before amputating a limb their instruments are carefully boiled and dried in the manner I have spoken of, and these gentlemen claim that the best thing one can do to bring about sloughing of a stump is to wash it with carbolic acid or other coagulant. Carbolic acid has as bad an effect on the leucocytes of the blood as it has on the bacteria and perhaps a worse one.

Dr. EDMUND NOYES: In explanation of what Dr. Nyman has just said, I will say that one of the surest ways to produce suppuration of a wound is to wash it with 95 per cent carbolic acid. It kills a little tissue, and the dead tissue is the best soil for the growth and development of germs.

Dr. G. D. SITHERWOOD, Bloomington: I feel amply repaid for being present at this meeting to hear this paper, because it opens up a field of practical work to us. I have not made any such experiments along this line, and can only speak from clinical experience. I have frequently examined cases that had been treated month after month with carbolic acid, by some other dentist, and yet the patient would state that the pulp chamber and root canals

were not filled. I can understand from these experiments that carbolic acid will diffuse itself through the dentinal tubuli, but that does not prove it is the best antiseptic. I was also glad to hear Dr. Peck make his remarks. I wish he would read all the results as stated on that card, as it so nearly corresponds with my own clinical experience in daily practice. While it is true that carbolic acid is a good medicine to use, yet I take a little different view from Dr. Brophy regarding the essential oils. There are essential oils that are good. The question arises, can we use carbolic acid as such, and then follow it with the use of some essential oil? I have tried a good many, and I still come back to eucalyptol, not the essential oil of eucalyptol which is given to us by Merck, but the volatile extract of Sander & Son. I find it much better in my clinical experience as it does not irritate the soft tissues, and as Dr. Wassall stated it does actually dissolve the septic matter from the dentinal tubuli, and a purified condition is brought about in that way.

I hope similar experiments will be repeated, and the work continued in order that we may arrive at the truth.

DR. GARRETT NEWKIRK: What I would have said has been partly covered by the remarks of Dr. Sitherwood. I was going to suggest that pending experiments we might get along a little while with the oil of cloves, eucalyptol, alcohol and chloroform, tincture of iodine, salt and water—something simple, that would be on the safe side. Let the experimentalists go ahead until they get this matter entirely settled.

DR. YORK (closing the discussion): I have listened to the discussion with a great deal of interest, because I know a paper of this character could not be read without treading on some people's toes. There are some dentists who have used carbolic used for a great many years, but they have never known why they used it. There are those who have not used it because they have heard able men say that it was not a diffusible agent. They were both wrong. We should find out these things for ourselves.

I am glad of the opportunity of listening to some parts of the discussion, and with reference to some of the comments made by Dr. Harlan, I do not think for a moment he would imply that my tests were not made in good faith. But, at the same time, he stated that the bromine water test was not a good one for the presence of carbolic acid in water. If I rightly remember, in a

paper Dr. Harlan read some time ago, he made the remark that if a tooth which had carbolic acid sealed in it, was suspended in egg albumen, that after the carbolic acid had passed through it, and did not coagulate the egg, which we would hardly expect it to do, as carbolic acid in minute quantities is only a feeble coagulator of albumin. He suggested himself the advisability of testing this albumin with bromine water. Now, you cannot test egg albumin with bromine water because you would coagulate it if you did. When I use the same test in water instead of albumin, he shows a disposition to belittle the result of it. Here is the carbolized water in which I put the bromine water, and he says according to Bloxam that we have to have a yellow deposit, he means of course tribromphenol. You will notice it at the bottom of this tube. We have to have an excess of bromine water in order to produce this effect. I would like to make Dr. Harlan a present of this bottle and if he watches it carefully he will see the tribromphenol at the bottom, showing that the carbolic acid has passed through the tube. This is one of the best tests for diffusion of the agent which can be made referring to egg test. Dr. Harlan stated that the fact of the water becoming cloudy was not due to the presence of the carbolic acid, but to the presence of organic matter, that you can produce it in ordinary water. We will try it. (Here the experiment was made with hydrant water, results nil.) I think you would get tired waiting for tribromphenol to precipitate, you cannot get it unless carbolic acid is present in the water.

Some of the gentlemen, e. g. Dr. Harlan, have wandered a little from the text of my paper in talking about nitrate of silver. I have filled the root canal of a freshly extracted tooth with nitrate of silver 25 per cent and placed it in an incubator, keeping moist, leaving it there for ten days, and it never received light until I sawed it in half, and the discoloration was there before the light ever reached it. Therefore, if he has extracted teeth treated in the same manner and has not obtained similar results I would say he has not got the canal thoroughly saturated with the nitrate of silver, or he would have noticed discoloration of the tooth when extracted.

I understand Dr. Harlan to have stated that carbolic acid is a barrier to its own diffusion; that after it has coagulated the orificial ends of a tube it will not proceed any farther; that it will not coagulate all the way. Am I right?

Dr. HARLAN: I do not believe it will.

Dr. YORK: I have here some capillary tubes that I have filled with egg albumin. These are as fine as I could draw them out. Of course, I could make them finer. I have here, you will notice, a capillary tube, which is hollow; egg albumin is drawn up into it by suction, the end put into a flame and sealed. We have a tube containing egg albumin, we put it into the dish with carbolic acid, the latter comes in contact with this end; if it was a barrier to its own diffusion it would coagulate there and penetrate no farther.

With regard to the experiments made by Dr. Harlan with teeth in this plaster, I hardly think to take a tooth and build up plaster around it, which gets dry and cold, is a fair test. It is not nearly the same condition that we have in the mouth. Try and keep it as nearly in the same condition as we have it in the mouth if you wish to get the same results that we do in the mouth.

With the iodine test, he says that I have not demonstrated anything. I would like him to state why we do not get a reaction of the blue iodide of starch in the presence of the salts of calcium of a tooth. Why don't we? We get it in the water and starch. Why don't we get it when we have pulverized tooth in the water? Because we cannot get the reaction of the blue iodide of starch unless we have free iodine. As soon as it comes in contact with the salts of calcium it becomes an iodide with one of the bases with which it unites, consequently there is no free iodine. You cannot get it. I would like Dr. Harlan to tell me wherein I have failed to demonstrate that point.

With regard to the remarks of Dr. Reid, they are all right. He is a good fellow. I do not care very much about what has been said concerning Sir Joseph Lister and others who use carbolic acid in their operations. I am not here as the champion of carbolic acid either as a disinfectant or antiseptic.

As regards the remarks made by Dr. Peck, he has wandered away a little from the subject under discussion, but I was very much instructed by what he said because he is always interesting. I think he has answered some of the questions I put to him some time ago not exactly bearing on my paper with regard to the pulp in a tooth that had died owing to a blow, for instance, and in that case we have a hæmorrhagic infection of the tooth, congestion and stasis with consequent death and a necrotic condition of the pulp. I asked him why we got pus in all these cases, and he said

it was owing to the presence of pyogenic bacteria in the blood. But I fail to find that the best writers tell us there are any bacteria in normal blood. Normal blood is sterile. It is strange that all of our patients who have this trouble must have bacteria in their blood. Take ten men, let them bruise their hands, and according to this theory they should all have abscesses; they should all have bacteria in the blood, but they do not. I looked up the contributions of Welch in the American Journal of the Medical Sciences, and he is as good an authority as we have. He says that bacteria are not present in normal blood or in the organs; that they are taken in by the mouth and lungs, but are not ordinarily there.

With reference to the remarks made by Dr. Wassall, I think they were a little irrelevant to the paper. As I have previously remarked, I am not here as a champion of carbolic acid as an antiseptic or disinfectant. My object is to show you that it will diffuse through dentine. He states that when you coagulate the contents of the dentinal tubuli, or when you do not, I think he said—when you seal it all up in there, it is innocuous. It is, as I said before, changed in its character; you make a different chemical compound; you cannot coagulate albumin and still have albumin pure and simple. You have a staple chemical compound, an insoluble one. If you put in an essential oil, you do not alter the character of the contents of the tubuli. It will pass away in time. If you put in carbolic acid and change the character of the tooth or the contents of the tubuli, you have left there an insoluble compound. It will last till the end of time, or as long as the tooth does.

With regard to sore teeth, he does not believe what I have said. He says he has cases of sore teeth. While that may be, he will find, if he could look at those teeth that the soreness had proceeded from the apex every time. You cannot differentiate as to whether it goes through the tooth or not. You must have something a little more definite than to say you have lame teeth. You must say how you have them. A lame tooth is not produced by septic matter passing through dentine and directly through the cementum and irritating the peridental membrane. It is altogether from the apex, every time.

With regard to the oil removing the characteristic color, carbolic acid does not need to do this; it has changed the character of the contents of the tubuli. Dr. Heitzman states that if we look at the contents of the tubuli with a microscope after they

have been coagulated, the living tissue will be found to be dried up and shrunken. In this event, this is no fit pabulum for the development of microorganisms. The microorganisms must have moisture, something that they can live upon; they cannot live upon albumin which is coagulated by carbolic acid.

I believe Dr. Lowry said something about its preventing penetration. Dr. Lowry did not see the tubes I have passed around, but I think now he will alter his opinion, or should, because the tubes demonstrate very clearly that carbolic acid will coagulate albumin the whole length of the tube.

With reference to the experiments made with extracted teeth, we have to use them as they are the nearest approach to anything we can get to teeth in the mouth. I would like to experiment on some teeth in the mouth and pull them out afterward, but patients might object. We have to make many of our experiments on the lower animals, as dogs, cats, guinea pigs, rabbits and mice. We do it because they are the nearest approach to human beings. I think the conditions under which I have made my experiments were as near the same as those we find in the mouth as possible. The teeth had been extracted, and within an hour I had carbolic acid sealed in the canal and the tooth in an incubator. There is no decomposition to take place in twenty-four hours at the outside of the tooth or anywhere.

With regard to the remarks made by Dr. Brophy, inasmuch as he did not touch upon anything more than the essential oils, there is very little or nothing to reply to.

Dr. Johnson's remarks were very nice and encouraging. He is always a friend to young men who try to push themselves forward, and I feel that if we had a few more gentlemen like him in the profession the younger members would not be so backward in attempting to stimulate the profession by preparing and reading such papers as I have presented to you. A short time ago I read an article in the *Dominion Dental Journal*, in which he said he always felt sorry for the young man when he first got up and read a paper before a dental society; and I thank him for his sympathy and kind words expressed toward me.

The clinical experience of Dr. Nyman is interesting as to the use of oil of cassia.

I believe I have covered all of the points that were brought out in the discussion, and I thank you for your attention.

ST. LOUIS DENTAL SOCIETY.

DISCUSSION ON DR. MARSHALL'S PAPER.

Dr. CONRAD: My talk to-night will be for the purpose of seeing that such theories and practices are not received without opposition in order that the young men may not be led into error, and follow practices which, if accepted, will bring harm to those who trust in their best efforts to save the natural organs intact. To ruthlessly cut off crowns of the natural teeth in order that some may gain easier access to difficult root canals, is to my mind bad practice. Skill to do superior dentistry is not gained by avoiding hard work, but by meeting the difficulties and overcoming them, like the men of skill, who have the best interest of the profession at heart.

Inferior first molar decayed on the distal surface, pulpless, merely represents a class. All other teeth are subject to the same conditions. So far as I can understand, the question is only a matter of "skill or lack of skill." I hope no one at the present time would cut off a natural crown to avoid the trouble of overcoming the obstacles encountered during the operation of treating and filling root canals of any tooth—the inferior first molar included.

About 5 or 10 per cent of roots are hard to treat and fill; consequently, the per cent is too small to justify us in the practice of cutting off the natural crowns of the first inferior molars in order to lessen the difficulties of root canal work. In fact, the advantages to be gained from cutting of crowns are not in proper proportions to the dangers we incur from the loss of such a valuable organ, particularly when 90 per cent can be easily treated and filled. Consequently, from the standpoint of a general practitioner, I consider the ruining of natural crown for any reason other than worthlessness, bad practice.

What is to prevent decay of the root after crowning? From my observation, where seemingly good crowns are cut off and artificial ones substituted, the roots decay at the gum margin about as often as they give trouble from pericementitis, particularly when the case comes from a fair dentist.

After a clinical experience of some years, I do not find the tendency of pulpless teeth to fracture as great as the doctor would have us believe. I do not consider it of sufficient frequency to

justify us in cutting off the crowns of the first inferior molar, or any other tooth, in order to crown it for the purpose of preventing the natural crown from fracturing.

When teeth are decayed upon the distal surface, and it is difficult to reach the canals, open from the anterior crown surface. Wedging with either gutta-percha or cotton will make many canals accessible.

Cutting off the crowns does not always make difficult cases easy, especially when the cause of the trouble is calcified matter in the roots.

Fracture of crowns is not as common as decay of the same class of teeth.

The difficulty of root canal treatment and filling is not confined to any class of teeth, fractured teeth likewise; consequently, good dentistry demands conservative practice in all cases.

Dr. BARTLETT: I do not think it necessary to cut through the grinding surface to reach anterior canals unless decay is present. Fill the distal cavity then open on anterior surface treat and fill roots. Do not consider these cases as troublesome as the anterior buccal root of superior molars.

Dr. FLETCHER: I fully agree with Dr. Bartlett providing you cannot treat and fill roots properly through the cavity; would certainly not cut off and crown but strengthen walls with oxyphosphate and fill with amalgam. Cases so treated last from five to fifteen years, while a split tooth is a rare exception. When this fails and walls crumble a crown is indicated and you have lengthened the life and usefulness of the tooth just the number of years the filling has lasted. Another point is this: Unless the tooth anterior is lost you will seldom secure as good an articulation with crown as nature provided. I try to follow Dr. Cushing's rule concerning broaches, viz., never try to twist a broach that binds in the canal. Keep Gates-Glidden drills out of roots and you will have better success and no trouble. In my opinion the percentage of this class of teeth that split is entirely too small to justify crowning all, at the same time you fill the roots.

Dr. KENNERLY: Under the circumstances save the natural organs by filling first, then crown if necessary. I follow Dr. Bartlett's method, but do not need a Donaldson cleanser or any long-handled broach. I am indebted to Dr. W. N. Morrison for the ease with which I handle these cases, having learned from him how to use the Swiss

jeweler's broach. Cut off the shank of broach and use pliers to place in tooth. Now rotate it between thumb and forefinger, having first wound with shred of cotton. If broach should break the cotton stays with portion left in canal and by means of it the piece may be removed. If the broach is barbed the barbs should be counted so you may know positively if any part remains in canal.

Dr. MARSHALL: I did not select the first molar because it is more difficult, but as a typical case and I consider what is true of it is true of the second and third in an even greater degree. In reply to Dr. Conrad's remark I do not think it is lack of skill in treating and filling but in the prognosis. This reminds me of a statement made by the late Dr. J. C. Storey concerning capping pulps. He said he never knew how many of these pulps died for when one did die the patient generally went to the other fellow. We cannot always secure as perfect occlusion with a crown as that which existed, but we can often obtain a much better one, so this should not keep us from crowning. In conclusion, will say that I expected opposition. All new ideas meet with it. And after all this discussion I am still of the opinion that not all molars but the majority of the class mentioned will give better satisfaction crowned than filled.

CROWDED COLUMNS.

We beg the indulgence of our contributors for another month or two to print the accumulated matter now on hand. We do not think any Journal has recently printed three such original papers as those of Drs. Smith, York and Harper in a single issue of a Journal.

If your friend is not a subscriber for the DENTAL REVIEW we will send him a sample copy.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

FACTS.

The editor of the *Dental Digest* desires a few facts and here they are: He agreed with the editor of this journal more than two years ago that he would not publish the papers of the Chicago Dental Society until they had appeared with the discussions in the DENTAL REVIEW. He violated this agreement without notice, by using the paper of Dr. I. A. Freeman in his March issue. This was done without authority from Dr. Freeman.

He was guilty of a similar discourtesy in using Dr. J. O. Ely's paper in his May issue. We protested in writing after the first offense. After the second we did it verbally. After the attempted third offense we protested again and those of our readers who see the *Digest* know what was published in the June issue. We say now as we said in our letters to the editor of the *Digest* if he desires this matter let him go into the meetings and have a report made and pay for it, or ask for the exclusive use of it. If the society desires to give it to him we will retire from that field and use other matter. We are not dependent on chance favors for matter. For nearly ten years we have published the papers and made reports of the meetings of the Chicago Dental Society without complaint from the members.

If they are dissatisfied we have not heard of it. We do not pretend to be a *Digest* or a pepsin scale nor do we overrate our importance, our circulation or our bump of wisdom, or our renowned ability as a reformer or manager of dental societies or savior of the profession from all sorts of imposition. We simply edit a journal that has its pages filled with good reading matter from month to month and we do not bolster up a bad cause by calling names.

DENTAL ANATOMY, SURGERY AND PATHOLOGY.

The section of the American Dental Association comprised under the above caption, by its Chairman, Dr. W. C. Barrett, of Buffalo, N. Y., proposes to introduce a new, commendable departure at the coming meeting of the association at Old Point Comfort, August 3 to 5 inclusive. It is nothing less than the collection and exhibition of an immense number of specimens relating to comparative dental anatomy and pathology.

Dr. Barrett has been exceedingly fortunate to secure the co-operation of the Wards, of Rochester, N. Y., who possess the greatest facilities for gathering and preparing such material for display. We remember with pleasure their mammoth exhibit in the Anthropological Building at the World's Fair in 1893. It is designed to collect an immense number of specimens, and members of the association are invited to bring with them, or to send to the chairman of the section, 1208 Franklin St., Buffalo, N. Y., or care of the Hotel Chamberlain, Old Point Comfort, Va., any interesting anatomical or pathological specimens. These will be properly cared for, exhibited and returned to the sender.

A suitable room for this display has been secured, and all specimens will be under the personal care of Dr Barrett.

The collections (public and private) now secured for the exhibit will be very complete, and scientifically arranged. It will comprise skeletons, skulls and dentitions of representatives of every class, order, and most of the species of the vertebrates, and very many of the invertebrates. There will be many fossils in it—dentitions of some of the birds of the tertiary age, reptilia of the mesozoic time and fishes of the Devonian age. The primates will be especially well represented, and homo will include both foetal and adult skulls of all ages and stages of development. There will be many pathological cases, and altogether there has probably never been such an opportunity for study and examination of different animal dentitions as this will give.

This certainly should add to the interest of the meeting, and it is hoped the profession will give Dr. Barrett every assistance possible.

PRACTICAL NOTES.

CHICAGO, June 29, 1897.

EDITOR DENTAL REVIEW :

I enclose a letter received from Dr. W. E. Griswold, of Denver, Col, regarding the use of pyrozone or peroxide of hydrogen for the painless extirpation of pulps. Dr. Griswold wishes that I bring the subject before the members of the Chicago Dental Society. As we have no meeting until October, I would suggest that publication of the item in the REVIEW may result in experiment on part of the members and that their experience may be announced at the next meeting of the society.

LOUIS OTTOFY.

Dr. Ottofy :—I have been using lately for extirpation of pulps a preparation consisting of 3 per cent solution of pyrozone aqua destillata *a a* q. s. or peroxide hydrogen in place of pyrozone.

It has proved so satisfactory that I brought it up before our State meeting where it received endorsement. I would like you to bring it before the Chicago Dental Society for discussion as to its merits, if you will.

Its action is on the pressure theory, of course, but produces an immediate whitening of tissue and insensibility lasting for several minutes, no sloughing afterward. In cases where abscess exists and are impacted some time the immediate and intense pressure causes some pain but not always. It seems to me an idea of possible benefit to the profession, relieving them from the purchase of expensive preparations, and I know of nobody more competent to sift its merits than the Chicago Dental Society. Whether it is an original idea or not I do not know, but have never had it suggested to me in reading or conversation.

If you bring it up and will be kind enough to let me know the report, will be grateful to you.

I am Fraternally

W. E. GRISWOLD,
Denver, Col.

MEMORANDA.

Dr. J. Lewis Smith is dead.

Ag N O₃ for sensitive bifurcation.

Dr. F. W. Huxmann has gone to Europe.

Dr. Geo. H. Cushing has returned from California.

Cataphoresis is all the rage now. What next?

Dr. Park has gone to the Pacific Coast Congress.

If the facing is too white rub it with fine pumice slowly.

Dr. H. S. Lowry, of Kansas, City, Mo., was in Chicago in June.

Dr. E. S. Talbot has gone to Europe to attend the Medical Congress.

Wisconsin State Dental Society meets at Madison, July 21, 22 and 23.

Are you going to Moscow? The International Medical Congress you know.

Dr. Victor DeTrey was in Chicago early in July and gave a clinic with solila gold.

Did you ever see a case of chronic arsenical poisoning after its use in a tooth?

Dr. J. L. Bingham has declined to serve on the Illinois State Board of Dental Examiners.

Dr. W. P. Dickinson is the secretary of the dental department of the University of Minnesota.

Wonder if that grammar school clause will go out of fashion before next year's sessions begin.

The American Dental Association will convene at Old Point Comfort, Va., the first Tuesday in August.

The Omaha dentists are trying to get the American Dental Association to hold their next meeting in Omaha.

The British Dental Association will meet in Dublin, Ireland, this year in the month of August, the 17, 18 and 19.

The Big Four trains from Chicago are about the most convenient to leave on as the trains go directly to Old Point.

The *Dental News*, Washington, D. C., Vol. I., No. 3, fifty cents per year, D. E. Wiber, M. D., D. D. S., editor.

The International Medical Congress will convene August 19 to 26 inclusive. It is expected that 3,000 to 4,000 will be present.

The new State Board of Dental Examiners will conduct examinations in "English as she is spoke." Where will the Germans go now?

The American Dental Society of Europe will not hold its usual annual meeting this year. The meeting will take place in London in August, 1898.

Catching's Compendium for the current year is out and is probably the most interesting of the whole series of volumes. Send for it and read it during the dog days.

The *Penn Dental Journal* is the latest of the college journals to appear. This is issued by the undergraduates of the University of Pennsylvania. Vol. I., No. 2 is very attractive.

Why not use tinfoil for filling teeth. It is said to be so good, and is so easily worked that if amalgam is uncertain and cements worthless, tin might be used to stand next to gold as a permanent filling.

American Dental Association at Old Point Comfort, Va., first Tuesday in August. Southern Dental Association same time and place. Big Four and C. & O. best routes from Chicago or Cincinnati.

Dr. A. O. Hunt has decided to locate permanently in Chicago at 1001 Masonic Temple. Dr. Hunt will make a specialty of dental prosthesis and art. Difficult cases are specially desired, either as consultant or operator.

Saturday afternoon is a bad time to have the toothache in Chicago, as most of the dentists are cycling, boating, fishing or away at the near resorts. Thirty-five hours per week in the summer and forty-two in the winter is long enough to stand at the chair.

Eucaine must be boiled to make a stable solution in water or liquid vaseline. About 1 part to 19 is best for general use. The manufacturers say that 9 per cent is about as strong as a clear solution will stand; when stronger the eucaine separates after a short time.

The way that pyorrhoea alveolaris is generally treated, both surgically and medicinally, is not creditable. Not recognized early enough; not thoroughly treated surgically; and little or no medical treatment. How a cure can be hoped for is a mystery we cannot solve.

What a revolution lately about alloys and amalgams. Ours is the best, of course we mean that which we use! Some one said recently that it was about time to have all amalgams made by the government, and then alloys could be stamped and sold on their merits.

The National Association of Dental Faculties will meet at Hygeia Hotel, Old Point Comfort, Va., Friday, July 30, 1897, at 10 A. M.

The executive committee will meet at 9 A. M. Thursday, July 29. Persons having business with this committee will please present their papers at the first session.

JONATHAN TAFT,

Chairman Executive Committee.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The fourteenth annual session will be held in the parlors of the Hotel Chamberlin, Old Point Comfort, Va., Friday morning, July 30, 1897, ten o'clock, and continue in session (with the exception of Sunday, August 1,) until adjournment. Matters of the greatest importance to the association will come before this meeting, and it is hoped every member of all the various State boards will be present.

"Hotel Chamberlin" and "Hygeia Hotel" rates will be \$2.50 per day, two in a room; \$3.50 per day, one in a room.

Fare from all points on all the railroads will be one and a third; take your receipt from ticket agent when purchasing ticket. The Old Dominion Steamship Co., Pier 26 North River, New York, will sell excursion tickets, including meals and berth, for \$11.20, sailing Thursday, July 29, 3 P. M.

CHARLES A. MEEKER, D. D. S., *Secretary*,
29 Fulton Street, Newark, N. J.

CHICAGO, June 28, 1897.

Kindly announce in July issue of your journal that arrangements for the meeting of the American Dental Association to be held at Old Point Comfort, Va., are about completed.

The Chamberlain Hotel has been selected as place of meeting and a rate of \$2.50 per day has been secured. The different railroad associations, with the exception of the Western and Southern Passenger Associations, have granted a rate of one and a third fare for the round trip on the certificate plan. The Western Passenger Association have refused reduced rates and the Southern Passenger Association have granted a rate of one first-class limited fare for the round trip. Reduced rates good going three days prior to July 30 and three days after the close of meeting.

You can also announce that a descriptive circular of routes, how to get there, and all about the meeting, will be sent out very soon. Yours truly,

J. N. CROUSE.

AMERICAN DENTISTS.

We hear so much from the "legitimate profession" about the iniquities of American dentistry as practiced in this country that it is well to look at the other side of the matter now and then. A correspondent sends us the following notes, which are curious reading:

Dr. C. F. W. Boedecker, a New York dentist, has been summoned to Berlin to render professional service to a member of the Kaiser's family. He has been offered, but declines the appointment of resident dental surgeon to the imperial family.

Recently a well-known American dentist of Paris, Dr. John H. Spaulding, was called to Russia to attend professionally the Governor of Warsaw and his family. Dr. Spaulding was a guest at the governor's palace on the occasion of the wedding of his excellency's sister-in-law, Mademoiselle de Ralli, to Prince Alexis Lobanow, nephew of the last Russian Minister of Foreign Affairs.

Dr. T. W. Evans, who is at the head of the profession in Paris, and has attended most of the crowned heads of Europe, appears still to be the favorite dentist of the English royal family, and a chair is specially kept at Buckingham Palace for his use when operating.

It is a little humiliating to Europe, and especially to England, that both dentists for royal families and daughters-in-law for aristocrats should have to be imported from the other side of the Atlantic; but we console ourselves with the thought that we are the richer for it all.—*Chemist and Druggist*.

THE

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No. 8

ORIGINAL COMMUNICATIONS.

DOGMATISM AND DISCOURTESY, THE RUIN OF DENTAL SOCIETIES.

BY WILLIAM H. TRUEMAN, D. D. S., PHILADELPHIA, PA.

Now and again, I have noted in the editorial columns of the dental journals, more frequently perhaps in the form of an inquiry, expressions of regret that the dental profession is not more fully represented in the various dental organizations. No journal has, I think, more earnestly or more frequently urged this matter editorially upon its readers than has the DENTAL REVIEW. Upon two occasions at least, that I now recall, it has, while deploring this lack of interest, invited a discussion of the subject in its columns, requesting not only an expression of opinion as to the cause of this indifference, but also suggestions that may lead to its removal. It has also, at various times, urgently called attention to this request, regretting that it has been completely ignored; no one having seen fit to accept it.

That there has been for years a waning interest, especially in our national organization, is so generally conceded that we must dismiss at once any suggestion that this silence is due to a disbelief in the premises upon which a discussion of the subject was invited. The little that has been said in explanation of this indifference has been, for the most part, of so rambling a character, so little suggestive of cause or cure, or so trifling in its general tone, that it has seemed to emphasize the widespread and profound apathy of the dental profession in the United States regarding a vitally important matter.

That dental organizations for mutual improvement and mutual

advancement, properly conducted, are a benefit, first, to those who take part in them, and secondly, to the profession at large, I presume to be unquestioned. Statistics seem to indicate, however, that they are ignored by a very large majority of the dental profession. Why is this? This is the vital question I now propose to consider, not, however, in all its phases; it is a many-sided question, and in its entirety far beyond the grasp of any but a master mind.

An expression in a review of the published transactions of the American Dental Association, page 342, of the April (1897) number of the DENTAL REVIEW, suggests to me the keynote of the whole matter. Referring to Dr. Wassall's paper the writer says, "He voiced the conclusions of bacteriological science up to date, and criticised with deserved severity those teachers who refuse to adapt either practice or teaching to the new obligations imposed."

Now, the question naturally arises, what right had he to criticise at all? Why was it deserved? Dr. Abbott, to whom Dr. Wassall personally referred, in the exercise of a judgment as enlightened as his critics, and in full possession of all the facts upon which Dr. Wassall based the particular method of procedure he insisted all should immediately adopt, preferred to practice and teach a different method which has, he says, for a long term of years given him perfectly satisfactory results. Why should he not? The merits of this case aside, why is it that a member of a dental association for mutual improvement, when giving his fellow members the benefit of his study of some one of the vexed problems that daily confront us, cannot stop when he has so done? Why is it that so many, in addition to giving their own ideas should feel it incumbent upon them to attack in a personal manner the ideas of others? It is of course all right to expound one's own views, to contrast them with the views of others, to show argumentatively why we prefer our own views, or the new to the old, and may be so done that all who hear may be profited. But, what good is done by injecting personalities; by calling a cautious brother a "fossil," or by impugning his motives, or by personally and offensively criticising his methods of practice? Is it professional? Is it gentlemanly? Is it politic? Is it generous? Is it just? Is it not a factor that has in the past, and is now, bringing about the so very evident disintegration we are discussing.

If we admit the right of any to become dictators, to lay

down for our guidance rules that we must without question implicitly follow, the vexed question of dental education will be quickly solved. The time for such nonsense has long since passed, if indeed it ever existed. The more fully the dental profession in its individual members approaches the ideal, educationally, for which it is now striving, the more energetically will it resist the attempt on the part of any of its members to exercise the dictatorial role. The history of dental societies in the United States is emphatic on this point.

The time was when many of the leading dentists of this country were, on what they considered to be unassailable scientific grounds, opposed to the use of amalgam, and opposition to it was the leading thought of most of the early societies. Every society that actively opposed the use of amalgam has ceased to be. Men of enlightened minds insist on doing their own thinking, free and untrammelled, and in a mutual society they insist upon, within wide limits, the right to express without being thereby made objects of ridicule or offensive remarks, their own opinions. Any society, which either by rule or license abridges this right does so at its peril.

Is it too much to ask that dental societies should be so conducted that all who attend may do so assured that they will receive that treatment a gentleman has a right to expect from gentlemen? Is it right, when a member or a visitor, who has been asked to speak, has given his method of procedure in a certain case, for a following speaker to say without rebuke, indeed, in some cases encouraged by the applause of his fellows, "I have little respect for the method suggested by the last speaker, and none for the lazy fellows who adopt it."

Is it right to impugn a fellow member's motives, or his integrity, or his intelligence, when he happens to differ with us on some matter of practice? I contend that it is not right in itself, and that the frequently accompanying rudeness is an outrageous breach of decorum no self-respecting man should ever be expected to quietly submit to. It is, however, repeatedly done; it is a discourtesy few escape in the American Dental Association who have the temerity to express views in conflict with the prevailing fad of the hour. I have known within my limited acquaintance, many who have gone to its meetings, and who would have remained earnest and zealous working members, but who, after

being treated to such discourtesy have returned to go no more. More than this; their experience when reported to the local society which sent them, has prevented others from trying the same experiment. Such cases as these, and they have been many, have been a factor, no doubt, in bringing about the much complained of want of interest manifested by the local societies in the national organization.

I know that it may be said that there are many practices that deserve to be condemned. But let me suggest, that history teaches and ethics also teaches, that it should not be done hastily or indiscreetly. First, be sure of the assumed facts upon which your censure is based; make sure that the standard to which you would have your brother measure up is not a mere shadow changing with the sun. Not every new method is a good method, nor every old method a bad one. The science of to-day is not infallible. They posed as learned and scientific men, who cruelly made Galileo blind, but we now know that in matters of science he was far in advance of those who condemned him to perpetual darkness. Look back a little and see how often those who refused to modify their practice to the new obligations imposed by the latest voicing of so-called science have wisely so done. The time was, when those who used gold as a base for artificial dentures were for so doing, by those who presumed to be oracles of dental science, denounced as quacks. Porcelain artificial teeth were denounced as roundly as vulcanite has been. Pulp devitalization has been denounced as murder. But a few years ago the latest voicing of bacteriological science required the immediate extraction of all teeth to any serious extent effected by pyorrhœa; later we are taught that this is all wrong, they should never be removed, but, by the skillful use of cunningly devised instruments, thoroughly scraped until the last infinitesimal atom of calcareous deposit has been removed.

The latest idea that I have noted, calls for the extraction one by one of each affected tooth; a careful polishing of its root and its replacement; the writer affirming that by this procedure, and this procedure alone, can a permanent cure be effected. On the other hand, a few days ago, at a dental meeting, I heard this scraping and polishing violently denounced as a mere subterfuge of either dishonest men or incapable ignoramuses, the speaker contending that by judicious systemic treatment, and by systemic treatment alone, could these conditions be controlled.

These are but samples of the many conflicting voicings of so-called science. They are mere fads, they are nothing more, and yet their exponents expect us to follow them round in their rambling scientific perigrenations and summersaults, like as a flock of sheep follow the bellwether. Those who fail to do so, and to promptly abandon a line of practice that for many years has given satisfactory results; or to promptly adopt some new fangled notion of which their judgments disapprove, they proceed to denounce as "blots on the profession," or "mercenary renegades," to be execrated and anathematized in season and out. These clattering pots and kettles make, in dental meetings, merry discord now and again; but in all earnestness let me ask, what good has ever been done by such like criticism? From all the harsh language used against amalgam and those who used it, is the community or the profession to-day one whit the better? Its use has steadily increased until it is now universal. Why? Is its universal use proof of its deserved merit; or is it proof that the dental profession throughout the world has, in these later days, sadly fallen from grace.

Tell me, if you please, of one single good thing that has been brought about, or one single bad thing that has ceased to be, as the result of these tirades that have been made from time to time upon methods of practice, or means or materials employed? What good has ever come from attempts to hamper individual thought, or to restrict undoubted and legal individual rights? That they have wrecked promising dental societies by the score we know. It is a matter of record. Is it not also largely responsible for the apathy so general, and the so pronounced wanting "esprit de corps" exhibited by the dental profession in the United States?

In charity, I assume that much of this is the result of mere thoughtlessness. Let me now ask attention to another equally serious phase of this, shall we call it, thoughtless discourtesy.

Every thinking man must know that among the nearly seventy million inhabitants of these United States are a vast multitude of hewers of wood and drawers of water whose means are, and always will be, limited; and also that a very large proportion of its practitioners must cater to the needs of these, and adapt themselves to their circumstances if the dental profession properly fills its mission. Now, the earnest desire to elevate our profession and to advance its interests is all right, but what do we mean by

these expressions? As used so frequently and so clamorously at dental gatherings, they are but meaningless catchwords. I take it, the mission of our profession, broadly expressed, is to prolong to the utmost the normal functions of the natural teeth. I take it that the parish of the dental profession is the whole world, and all the inhabitants thereof. I take it that the dental profession includes all who are earnestly trying to serve the community in which they live. I further take it that any dental society looking to the profession for support must make itself useful and acceptable to those whom it desires as members. It has seemed to me a serious fault that so many dental organizations have ignored this. While complaining of their limited membership and the little hold they have upon the profession at large, they have made no effort to reach and help those who must ever be largely in the majority; those who must work for and cater to the needs of the moderate wage earners. Is it at all helpful to a dentist who has chosen this as his field, who, venturing into a dental meeting, asks for some suggestion that will enable him to make his work less costly, and thereby more within the means of his neighbors, to be told that he and such as he are a bane to the profession, that it should be his ambition to make his work worth more rather than less, that he should educate his patients to a higher appreciation of dental services, that he should banish forever from his mind this driveling dollar and cent business, do the very best he can regardless of expense, and make the patient pay? To him these are all impracticable platitudes; indeed, they are at best for the most part meaningless expressions, and their constant and thoughtless reiteration at dental meetings is neither helpful nor wise.

A dental club may be exclusive, and fully meet the needs of all its members and fully occupy its intended field. So may a purely local dental organization, or one having some special or limited mission. In a measure, any strictly professional organization must be exclusive. A dental organization having for its objects the advancement of professional interests must exclude all those whose presence would defeat its intended object. So far as I know, no just complaint can be made in this respect regarding the organic law of our dental organizations; it is with the conduct of their leading members, those who control their meetings, the fault lies, if fault there be. It has been charged, and I think justly, especially regarding the American Dental Association, that

it has no welcome and no regard for the less wealthy of the profession. Their wants are ignored, and their position often spoken of with derision and contempt. It requires no very careful overlooking of its published proceedings to show just grounds for this complaint. While it invites and admits to membership all worthy members of the profession, it requires but a short experience for a brother who must be satisfied with a small fee to find that his yearly dues are more welcome than his presence. However worthy he may be, or how careful of his professional obligations, he will be fortunate indeed if he is not made to feel that somehow he is a disgrace to his calling. Now, these humble brethren are a power behind the throne all dental organizations must reckon with. It is their presence that makes the successful meeting; and their absence is the wet blanket that makes it, in spite of the creditable papers presented, a dismal failure. He may not appear on the program, nor yet take part in the discussions; he may be far more interested in looking over the dealers' exhibits and selecting such as he needs than in the election of officers. These exhibits, to the man so situated that he seldom sees more of a dental depot than the contents of a drummer's grip sack, assume an interest and importance scarcely realized by his more favored city brother, who would if he could, banish from dental meetings these interesting and instructive evidences of an important phase of dental progress, superciliously referring to them as a mere truckling to trade. Our humble brother, as a rule, takes but little interest in the long and prosy papers on purely scientific matters, whose bearing upon everyday practice is at best a remote contingency, and endures, perhaps impatiently, the long drawn out explanations of the intricate and artistic operations a millionaire alone can afford. His is usually a hard life, and intensely practical. With his patients time is money, and ready cash a rare commodity. The most pressing problem with him is to afford his patrons the utmost dental service their limited time permits them to receive and he can afford to give for the cash they have to spare. The dentist of ample means, with a practice yielding a princely income, can afford to glibly rant on this driveling matter of dollars and cents, and to expatiate upon the importance of educating patients so as to facilitate the transfer of golden ducats from their pocket to his; but the dentist whose lot it is to work for those whose arduous daily toil affords but little more

than the bare necessities of a decent living, have a different and far more knotty problem to deal with. He knows full well how little of their meager earnings are available for his services. He knows too well the limited providing powers of his hard earned dollars, and knowing these, he has daily to face the problem of doing the best for his patients and yet being just to himself.

He wants to know how long operations can be shortened with a minimum loss of efficiency; how expensive operations can be made less costly with the least loss of usefulness. It is not with him the best that can be, but the best that may be. How much help can he get on these, to him, intensely practical points, from the general run of dental society papers and discussions? The men in our profession who have to face these problems are vastly more numerous than those highly favored ones whose bills, however large, are always promptly and cheerfully paid, and no questions asked. To them is largely due the small percentage of the dental profession interested in society work. They are not welcome at society meetings, they cannot go there and feel at home. Their needs are ignored; their position and usefulness is neither appreciated nor respected. Among them are many Dr. MacLures, faithfully and earnestly working for their patients' good. They are in the business for what they can get out of it just as all are, yet honestly earn every penny they get.

The dentist who boasts that no working woman or laboring man has ever been invited to his chair and never will be, and urges his brethren to elevate the professional standard by adopting the same exclusive rule and those who regret that it is not possible to deny admission to the dental profession to all who have not independent means enabling them to live in a style befitting the dignity of a professional gentleman, and those who indulge the hope that in the near future the dental parlors, and dental associations, and the whole category of cheap dental offices will be legislated out of existence, permit me to suggest, will not prove wise prophets or sagacious leaders. Every properly qualified practitioner has a perfect right to select his own field; to make it as exclusive or as cosmopolitan as he chooses, and should be perfectly free to do so without thereby losing his professional standing. From the highest in the land to the lowest, the meanest or the most degraded, every sufferer from a dental trouble has a claim upon the dental profession for that relief which it is able to afford. The dental association

office, and the cheap dental parlor, rest assured, are here to stay. They cater to a class for whom no other provision is made, and I am impressed as time goes on, whether we like it or not, they will wage a competition with the private practitioner that cannot be pushed aside. Already, the business side of surgery and medicine keenly feels the inroads made by the dispensaries and hospitals, public and private ; while the community is coming to see more and more that these well equipped institutions are able to give them a far better service at a vastly reduced cost. We have here the effect and the cause, which, as time goes on, and the old prejudice against these institutions dies out, will become more and more pronounced. I am impressed that in the future the dental profession will encounter a like keen competition. As a science, both surgery and medicine have greatly advanced under the new regime, and probably so will our science, and its usefulness to the community thereby be greatly increased.

The attempt to control this, which, however much it may affect private interests, is a public good, by legislative procedures, will in my judgment, prove futile. Just as soon as restrictive legal measures are found to clog material progress or to injuriously affect public interests they will be wiped from the statute book as with a sponge. The trend in this direction is seen in the increasing difficulty of persuading legislative bodies to pass more stringent enactments; and recently in the fact that the governor of Illinois practically ignored the dental societies when appointing the State board of dental examiners. The quixotic antics of the National Association of Dental Examiners at their last annual meeting will hardly commend them to the favorable notice of the thoughtful; and will probably lead, as it should, to putting better material in so responsible a position, and to seeking it outside of the societies if need be.

I take it, a mere consolidation of dental societies will do but little good. A reorganization that does not appeal more strongly to those now outside than does the present organization, will be a doubtful experiment. Far wiser will it be, I think, to find out why the present body has lost its grip, and to earnestly seek to bring it more in accord with the great body of the profession. Remember if you please, every properly qualified practitioner of dentistry is a member of the dental profession, whether he is a member of a dental society or not. A national body that interests a mere tithe of the profession only, is at fault somewhere.

In conclusion: Most earnestly would I commend to all who have the good of our dental societies at heart, a careful reading of Dr. W. C. Barrett's letter, Vol. V. DENTAL REVIEW, January 1891, page 54, describing a meeting of the British Dental Association. I would indeed that it could be said of our meetings as he says of theirs, "The uniform courtesy with which a speaker is treated in an English meeting, and the general air of decorum manifested, are very pleasant to behold."

TO WHAT EXTENT ARE WE JUSTIFIED IN GIVING OUR PATIENTS
SYSTEMIC TREATMENT.*

By I. P. WILSON, D. D. S., BURLINGTON, IOWA.

I had prepared notes for a paper on another subject for this meeting, when a list of topics was received from a committee appointed by the American Dental Association, with a request that the subjects named by said committee be discussed at our various State meetings, and that papers be written with that thought in view.

The plan is an excellent one, and deserves the hearty co-operation of the entire profession. Such a request, however, should have reached the profession soon after the appointment of said committee nearly one year ago, and not on the very eve of our State meetings. Time is now too limited for the careful preparation these important subjects deserve.

The one I have chosen from the list has for many years been ably discussed by both the medical and the dental professions.

But the differences of opinion still existing in the professions is, it seems to me, sufficient evidence to warrant us in the conclusion that systemic treatment has not been satisfactory.

It shall not be my purpose to condemn present methods of treatment, but to call attention more particularly to nature's plan of furnishing building material for the animal organism prepared in her own mysterious laboratory.

The inexorable laws of nature will not tolerate artificial substitution. It is only when we fall into line with nature, and offer assistance in harmony with her laws, that our proffered aid is accepted. Her ever evolving processes, both in the vegetable

* Read before the Iowa State Dental Society, May 6, 1897.

and the animal kingdom, work out her unerring designs in the great economy of nature. She will not be thwarted in her plans, nor will she surrender her methods for those of man.

If the blood is impoverished, if there is a deficiency of building material in its composition, the deficiency must be supplied in a natural way. We cannot pour into her great reservoir the needed elements that have been prepared in our chemical laboratories.

Both the animal and the vegetable kingdoms derive their nutrient material originally from the earth; but these elements stored away in the earth are not ready for the use of the animal kingdom until they shall have passed through the process of first being incorporated into the vegetable kingdom.

The ox feeds upon the grass, and the flesh of the animal become delicious food for man. The sheep receive their nourishment from the same source, and man appropriates the elements found in its tissues for the building material his body demands. The swine thrive, too, on the herbage of the field, and the porker, likewise, becomes food for man.

The same grass that produces the tender, juicy beefsteak produces also the toothsome mutton chop, and the greasy flesh of the swine. No chemist can extract from the vegetable kingdom the peculiar combinations of nutrient elements necessary to produce the characteristics belonging to the animal organisms above referred to. Nature alone can do this work, and she does it in her own mysterious way. Inorganic matter, it will be observed, must first become incorporated into the vegetable kingdom before it can become reorganized into the animal kingdom. Omnivorous animals, to which man belongs, require that nutrient material may be assimilated after being once organized into the vegetable kingdom, while the carnivora cannot assimilate food that has not been organized a second time. Not only must the earthly phosphates be organized into the vegetable kingdom, but must be reorganized into the animal kingdom before the flesh-eating animal can appropriate the nutrient material to its own use. The flesh of such animals is quite repulsive to man, and cannot be used as food.

The vegetable kingdom, too, can only be nourished in nature's own peculiar way.

We cannot force upon her nutrient material that has not been properly prepared in accordance with nature's laws. Vegetable

and animal matter must undergo decomposition, and enter into chemical combination with the soil, before the vegetable kingdom can again utilize it as building material. Some years ago I removed the sod and considerable poor soil from around some choice trees, and filled the basin I had formed around the trees with partially decomposed sawdust, thinking that the decaying wood would furnish excellent nourishment for the trees, but I came near losing my choice trees. The sawdust contained the proper elements, but they had not been chemically prepared for assimilation, and nature refused to accept the gift.

Again, nature has provided us with atmospheric air with the proper proportions of oxygen and nitrogen to produce, when taken into the lungs, the oxidation of the blood, and the necessary combustion in the tissues to produce animal heat. But when a chemical change is produced in the air, and we are given nitrous oxide, which is much richer in oxygen, nature refuses to utilize it. It will not be decomposed in the lungs, but will be expelled in an unchanged state, producing a pathological condition, which if not carefully guarded will soon cause death.

We cannot tamper with nature's laws with impunity. Our physical organisms are subject to her inexorable decrees. Physiological and pathological conditions belong to life, and must be governed by the laws of life. Health and disease apply only to living organisms, and not to the dust of the earth. But vital force, or life, both in the animal and the vegetable kingdoms, has its origin in earthly matter. The mysterious processes of organization are carried on under the genial rays of the sun. Nothing can take the place of the great luminary. Artificial light will not serve the desired end. Life cannot long exist without solar influence. An experiment of this kind was tried some years ago in the mammoth cave of Kentucky.

The air in this cave is very pure and invigorating, and one can scarcely spend a half day in wandering through its marvelous caverns without experiencing a buoyancy of spirit that approaches intoxication.

On visiting this wonder of nature some years ago with a party of friends we were weary and oppressed from the heat of a sultry August day; the trip of seventeen miles down into the darksome earth was made without fatigue, and when we came out into the sunlight again the air seemed laden with noxious vapors, and it was diffi-

cult for us to believe that the outside air had not, in some way, been contaminated since we had entered the cave. The contrast was marvelous.

In passing from one chamber to another, we finally entered one of enormous proportions, and were told by our guide that one of the largest churches of New York City could stand in that mighty cavern, and the steeple not reach the ceiling.

We found here several well built houses, and were told that a number of invalids, chiefly consumptives, had caused those houses to be erected some years before, and after furnishing them in modern style had taken up their abode there with the hope of being restored to health. Artificial light was employed that equaled the midday sun in brightness. Domestic animals were domiciled with them, and plants were cultivated.

The invalids seemed greatly benefited for a time, but ere long their hopes were dissipated, for one after another grew worse and died, until the remaining ones returned to their homes on *terra firma*.

The domestic animals, too, began to fail, and vegetable life grew pale and sickly.

Pure air is a good thing, but it must be accompanied by sunlight in order to support life. Neither animals nor vegetables can absorb from artificial light the vitalizing power that old Sol has in store for them.

The profession has for years tried in vain to improve the structure of the teeth of pregnant women and anæmic children by feeding them on certain kinds of food, rich in the phosphates, but our expectations have not been realized. The plausible theory of feeding the impoverished organism with food that contains the missing elements has been advocated and practiced by some of us for many years. We have all seen what we have believed to be beneficial results, but we have not found the panacea we have so much desired. We have not gone to the root of the difficulty, and so have not found the remedy.

I have already hinted at what I believe to be a large factor in producing a vigorous, healthful organism, and that is sunlight. Another factor of equal value is active, physical exercise.

Contrast if you will the buxom country lass with the cultured young ladies of our towns and cities. Contrast also the maid with her mistress, the servant with the housewife, the farmer with the

merchant, the plowboy with the clerk, and while these comparisons are by no means odious, they are certainly significant. The physical condition of the one, as a rule, far surpasses that of the other.

If our city patients have better teeth than country people, it is because of the hygienic treatment they receive and not because of their manner of living. Country people, as a rule, are woefully negligent of their teeth. There are many exceptions to this rule, and the exceptions are in favor of those who adopt regular habits of physical training, and closely observe the rules of general and dental hygiene.

It is not enough to take a quiet walk, or an easy carriage ride once a day. The heart's action must be aroused, the circulation quickened, the pores opened and relieved of their poisonous contents. The circulatory system needs a freshet occasionally to clear out its accumulated rubbish. Transpiration becomes sluggish if the heart's action is not sufficiently increased at times to dash the crimson current through the arteries with sufficient force to open its flood gates and carry away the refuse. The Turkish bath would not then be so great a necessity, nor would massage treatment be so in demand.

Action is what we need more than being acted upon. The man of labor has an immense advantage over the man of leisure. Physical exercise of a vigorous character creates in the system a demand for just the elements needed for building material, and without that demand on the part of nature, we shall fail in our endeavors to build up the impoverished tissues.

Our purpose then should be to bring the human organism into harmony with nature, and create a demand for the missing elements. Our food abounds in nutrient material, provided by a kind providence, and when the animal economy is in a physiological condition to receive and assimilate those natural elements, they will be appropriated to their intended use. The hungry tissues will then exert their attractive power, and draw to themselves the elements their famished condition demands. How this is done, I do not know. "Nature works in a mysterious way her wonders to perform."

Electricity, that subtle influence that is limitless in its power, and is astonishing the world to-day, may be the hidden power, the vital element, in both the vegetable and the animal kingdoms, that controls organic life.

My plea, then, is for a study of natural processes, more than to combat plausible theories. We should base our conclusions upon stubborn facts, that are continually staring us in the face, rather than content ourselves with what has been written and accepted as authority. Limited observations should not be recorded as facts.

It is not safe to draw conclusions from isolated cases. We often give our treatment credit for what nature has done for us. Phosphates are prescribed for a degenerate condition of the teeth of young men and young women during the taxing years of rapid growth, and the nervous strain of school life. The teeth suffer more at this period than at any other time in life, except it may be with the mother during the years of child bearing. At such times constitutional treatment has been resorted to with more or less satisfactory results.

The impoverished condition of the teeth of the mother does not usually subside until after the period of child bearing has passed, and we have learned from sad experience that we can scarcely expect the teeth of rapidly growing children to be permanently filled with gold until they have reached the years of maturity. Nature then comes to our rescue, and with her coöperation we are able to secure the most satisfactory results. Lime salts administered at these transition periods may get the credit of doing the work that nature herself has accomplished. It is very doubtful if phosphates thus administered are builded into the tissues. It is more probable that these salts are received as foreign matter and thrown off as such. If so, they are positively harmful in their effect.

It may be safe to assume, however, that where there is a craving on the part of the animal organism for inorganic matter, that craving should be satisfied. It does not follow, however, that such demands are made for the purpose of building unorganized material into the tissues of the body. Nature has some other use for these foreign substances, which we shall find it difficult to understand.

Why do school girls eat chalk and chew up their slate pencils? Why do horses and some children eat clay, and do it with a relish? Why do pregnant women eat magnesia and charcoal in preference to more dainty deserts? I do not imagine for a moment that any of these inorganic substances enter into the formation of tissue.

The demand has been made for some other reason. It may have been for a mechanical purpose, more likely to aid in chemical action. Nature had an important service for this inert matter to perform, or the demand would not have been made.

It is argued by some that inorganic matter is utilized by fowl, that we must feed gravel or oyster shells to our hens or they will lay shell-less eggs. This argument seems to be conclusive, but when we remember the mechanical use to which the gravel is applied in grinding the food and preparing it for assimilation, we find no evidence that any part of the gravel has entered into the formation of the eggshell. On the other hand, it seems quite certain that these foreign substances are taken into the digestive system of the bird for the sole purpose of grinding its food and preparing it for nutrition.

Again, chloride of sodium (or common salt) is in great demand by man, and by some of the lower animals. It doubtless has an important function to perform in the animal economy. It is probably not utilized, however, in any way as building material. I do not know that it undergoes decomposition. It is certain that a large portion of salt passes from the system in the secretions. The perspiration is decidedly salty, and the urine is said to be impregnated with it. Nature may use chloride of sodium as a purifying agent in preserving the broken down tissues of the body from putrefaction until expelled from the organism.

In conclusion, let me give an illustration that will demonstrate more fully the thought that I have endeavored to set forth in this paper.

Some years ago a lady patient of mine was in poor health, and had for years been under the care of her family physician. Her teeth were exceedingly sensitive, and required almost constant attention. She had but little relish for food, and assimilation was very imperfect. Her naturally cheerful disposition finally gave way to sadness and gloom. She became dyspeptic, nervous and irritable.

Full of complaints in the morning, a forced smile at noon, tired in the evening, with no hopes of being refreshed at night by "nature's sweet restorer." She was a chronic invalid. Her life up to this time had been one of ease and comfort. Finally her husband purchased a few acres of ground in the suburbs of Chicago, and they built for themselves a homelike residence. A gar-

dener was employed to lay off the grounds, and vegetables, small fruits and flowers were cultivated.

The sick woman took a peculiar interest in these new environments, and soon became actively engaged in looking after and taking care of the grounds. Her health commenced to improve, her strength increased, which stimulated her to still greater physical exertion, until she was at length enabled to spend the most of the day with her flowers, not loitering listlessly around, but with gloved hands, vigorously using the hoe and the rake. Her husband (foolish man) was not willing that his wife should be seen working in the garden, and when he left her for his place of business in the city, in her attractive breakfast gown, little suspected that a sunbonnet and other suitable apparel for outdoor work would be quickly substituted.

As the evening hour were approaching when her husband was expected, she would again appear before her mirror, in as attractive a manner as possible, and await his coming.

The autumn came, and with it a restoration of perfect health. Roses began to bloom upon her cheeks, as well as in her garden.

Three meals a day were taken regularly, and with a relish. No trouble now about assimilation—no more sleepless nights. No more tonics were administered—no doctor's bills to pay.

A demand had been created for tissue building elements, and the food that had not before supplied that demand, now yielded up its rich store of nutrient material.

What must be our conclusions. There can be but one explanation to the wonderful change wrought in this lady's health, viz., an observance of hygienic laws.

The question asked in the subject of this paper has only been answered by inference and it may be that I have not sufficiently defined my position.

I have desired to place great stress on healthful physical exercise and sunlight. I by no means condemn systemic treatment, when the remedies administered are the products of organized material.

In other words, I have but little faith in the administration of mineral phosphates, believing that the animal organism cannot use such building material, but will throw it off as foreign matter.

I believe, however, that it is quite probable that many of the cereal preparations, rich in the phosphates, may be assimilated and

built into the tissues; but even these preparations are useless if the impoverished tissues are not in a physiological condition to demand, and attract to themselves the nutrient material.

The question, then, becomes one of supply and demand. The supply will be of but little use if there is no demand for it, and if that demand does not exist it must be created. In the case related above, I have endeavored to show how that demand may be created.

The eternal decree gone forth that "man shall earn his bread by the sweat of his brow" was not intended, it seems to me, as a curse, but as a blessing in disguise. As a hygienic measure it has no equal.

The Creator Himself has given it to us as a law, and the observance of that law will bring health and happiness to the human race.

SUGGESTIONS ON DIAGNOSIS.*

By E. S. CHISHOLM, D. D. S., ST. LOUIS, MO.

Through our five natural senses do we gain knowledge. Each of these senses bears testimony to external things and conditions. Any one of these alone, would not, of itself, be sufficient evidence to establish a fact, unless reasoning from cause to effect be exercised concurring with this one sense. However two or more concurrent senses may establish a fact beyond questioning, and the result becomes knowledge.

The application of this knowledge in the recognition of disease, its specific forms and characteristics, and to properly classify it, is what is meant by diagnosis.

This word may be defined as knowing through, or discriminating disease, recognizing its peculiarities as contra-distinguished from other diseases. Therefore any one of the senses above named, which proves or disproves, must be taken into account, and unless set aside by conflicting testimony must be accepted as concurrent evidence.

Significantly upon our subject and closely identified therewith bears the etiology and prognosis, or the causes of disease and its probable progress and termination; all of which must receive full appreciation to enable one to a successful treatment. The power

*Read before the St. Louis Dental Society.

of discriminating or differentiating one disease from another is implied so fully in the word diagnosis itself as to lose much of the distinctive meaning given to it by various writers as has been classified "differential diagnosis," because to know a disease signifies to differentiate it as well.

A growing tree may be recognized as an oak. Our sense of sight of its general appearance, our touch of its bark, our hearing the rustling of its leaves, our taste of the tannic acid in its wood, together with its smell, puts all five senses in concurrent proof of its being an oak. Its cause or etiology may be known by reasoning that oaks spring from planted acorns, nurtured by water, air and sunlight, which produce trees. We may prognose a crop of acorns in the winter, and can easily differentiate an oak from an apple tree. In the same rational way do we come into "knowing" disease.

Our pains and aches are our best friends and advisers, and warn us of physical disturbance tending to destruction, although few of us like advice so disagreeable, and not sought. And just here you will pardon me for saying that I can conceive of great detriment from the abuse of obtundents from cataphoric induction of medicaments, thus setting aside the natural use of sensory power which is the only self-protection our teeth possess until nerves may be so nearly exposed from grinding and cutting as to never recover their normal condition, when if they were allowed to speak through our patient's mouths, we should not treat so abusively.

To depend too much on the statement of patients for a diagnosis is one of the most common mistakes in dental practice, yet their statements must receive a due weight of consideration. Uneasy sensations are experienced here and there and they will say that every tooth in the mouth hurts, or that a number are aching at once. My experience convinces me that it is quite rare for more than one tooth to be the cause at one time, and its location may generally and quite easily be determined. This wrong impression tends to discourage in an effort to save the teeth. And especially is this so, when they return to us for treatment, having recently been through "the tooth repairing process," which often leaves them so susceptible to morbid conditions, as from depletion, thermal shock, tending to soreness, from undue bearings of fillings, soreness from separation, and a general want of restoration which will come sooner or later naturally. The feeling is often located

very remote from the true cause, due to reflected nerve action. Symptoms light, pain diffused over such an area as to prove a formidable barrier to correct diagnosis, yet patient experiencing more or less discomfort. In such cases it were better to keep the confidence of our patients by not being too hasty in expressing an opinion, but to use some simple paliative as a counterirritant to apparent seat of disease and await further development, with the instructions to call again if symptoms continue. Recently a learned specialist of our city was called upon by a lady suffering with an acute eye trouble. After an hour's examination he dismissed her with the consoling remark, "Madam, I don't know what's the matter." She lost confidence, he a patient, also a chance to observe the prognosis of this peculiar affection.

The human system is like all other mechanical structures, never stronger than its weakest point, and just here will give away first. These weak places may be the lungs, kidneys, eyes or teeth, and are alike liable to morbid impressions depending on systemic conditions. Depressing atmospheric phenomena invites inflammation to weakened points. Anæmia from protracted illness, biliousness, etc., are forms of constitution frailty. Especially are persons of a highly neurotic tendency (and the civilized world is growing more so each day) liable to occasional disagreeable sensations about the face and head if there exists the slightest cause.

In cutting and grinding on sensitive teeth but little benefit can be had by applying cocaine, as the electric wires of life come from within out while we cut from without in, and our obtundent should be at the other end. Nor can hypodermic injection, entering gum, bone and apex, thence to nerve ganglion and through dentinal tubes to the periphery whence the cutting is going on, be of much use.

The sealing up such remedial agents as are durable in sensitive cavities to remain some days will prove valuable, especially when broken down structure exists leaving in full vitality the animal tissues. For this purpose I have never found a more valuable formula than two parts oil cloves with one part carbolic acid.

Along this line we hail with delight the many statements of the successful transmitting of medicaments into, and through the hardest tissues of the body by cataphoresis. If all be true as stated it may prove one of the greatest boons to suffering human-

ity, and no less important as a therapeutic agent than the X rays as a diagnostic.

In diagnosing for remote disturbances of the teeth, my method is to select the most healthy one in appearance, at the same time placing some obstacle in way of the tongue's touching it, for tongues often lie.

On this tooth gentle tapping is applied, with request of patient to state if the least tenderness or soreness be noticed. From this test others, and when the true cause of trouble is reached a flinch and contracted brow will be noticed, which speaks in words louder than the tongue.

All exposed surfaces of our bodies have tactile sense, or the power to locate any point of disease or surface touched. This is not true of tooth pulps and lesions beyond this as the antral cavity and internal and remote regions; for they can only speak in words of pain more or less intense.

A few days ago a lady with deep seated pain in left upper jaw had come to conclude the trouble came from a newly discovered roughness of a bicuspid, when in fact it was a dead wisdom tooth. The tongue had made the mistake.

The peculiar sensory power of the teeth may be one ground of misleading us. The pulp promptly responds to any injury inflicted by sense of pain only, not touch, and to thermal change, even more promptly than does any other organ or tissue. From this fact, I am inclined to adopt the theory advanced by able microscopists that the feeling power is communicable through protoplasm rather than nerve tissue, since the dentinal tubules have not as yet revealed any nerve substance. Again protoplasm is clearly demonstrated as possessing sensation and exhibits change of shape and motion when touched by the common reagents most liable to affect the tooth sensation, as cold, heat, salt, sugar. Through no other plausible reason can the phenomena of hyper-æsthesia be accounted for. These reagents too are valuable diagnostics in demonstrating conditions.

A common mistake often made is testing for vitality in root canals with a broach rolled with lint or even a close fitting broach. Such becomes a piston with a column of air which may press so severely upon the terminal end of nerve at apex as to inflict violent pain.

A test for discharge from a root or roots may be recognized

and differentiated by the odor so peculiar to this form and location of pus. However a preparatory use of any of the forms of H_2O_2 will prove far better, as the existence of purulent matter may be recognized by the frothing. However, other fluids and secretions will froth which are not necessarily degenerate in their nature.

PRACTICAL THINGS IN DENTAL PRACTICE.*

By J. G. TEMPLETON, A. M., D. D. S., PITTSBURG, PA.

To speak of and illustrate practical operations in dentistry, many methods are often suggested, one of which we select as the best for our purpose in the performance of each or all parts of our work.

In our effort to describe "practical things in dental practice," what we have to present is in a fragmentary form, without any connection of one portion with another our aim being to give briefly the methods we have found to be most useful in our daily practice, trusting that some of the younger men may have their attention called to some things, that may be useful to them hereafter; some of the things we shall present have been obtained from members of this society (to whom we shall give due credit); and if we fail to interest some of those present, such ones are respectfully requested to listen for the sake of those who have not heard as much thunder as some of us have.

The first item we would mention is a method of protecting the pulp from thermal changes, something of this kind is necessary in all deep cavities; the method we usually adopt is to thoroughly dry the cavity with absolute alcohol, next coat the inside of the cavity with varnish made by dissolving common resin in chloroform, then cut from a thin piece of asbestos felt a piece just large enough to cover the bottom of the cavity and moisten with wood creosote or campho-phenique and cover one side with a mixture of oxide of zinc, iodol, and vaseline or alboline, and place the same over the bottom of the cavity, and a filling can be inserted that will not convey heat or cold to the pulp.

It is our humble opinion that the old-fashioned, bur drill and excavator should be used more than they are in the preparation of cavities instead of relying entirely on the burring engine as very many do.

*Read before the Illinois State Dental Society, May 1897.

The engine and the sharp bur may be very satisfactory to the operator, but very much less so to the patient.

To make moisture tight gutta-percha fillings: Dry the cavity well, place in it a pellet of cotton saturated with absolute alcohol, remove the cotton and with a warm air syringe evaporate the alcohol, varnish the cavity with a solution of common resin in chloroform, warm the gutta-percha and pack with a cold instrument; heat a thin-bladed instrument and pare off the surplus gutta-percha; any further trimming or polishing required may be done with oil of cajeput.

If these directions are carefully followed your gutta-percha fillings will be absolutely moisture tight; notwithstanding anything that has or may be said to the contrary.

To protect from thermal changes, particularly in deep cavities where the pulp is not quite exposed, first dry with bibulous paper, then apply on a small pellet of cotton absolute alcohol, which has a strong affinity for any moisture that may be left in the cavity or open ends of the tubuli. When the cotton is removed evaporation takes place rapidly, leaving the cavity perfectly dry. Now varnish inside of cavity to near the margin with a solution of common resin, in chloroform, or of gum sandarac dissolved in sulphuric ether; then take a small piece of asbestos felt, moisten with pure wood creosote, campho-phenique or oil of eucalyptus; cover the side to go next to the pulp with a mixture of iodoform, oxide of zinc and vaseline. Now place over the bottom or that portion of the cavity nearest the pulp, now over this place a thin piece of lead or a thin piece of aluminum plate, which will prevent pressure against the bottom of the cavity while inserting either a gold or other metallic filling.

TREATMENT OF PYORRHOEA ALVEOLARIS.

This is a term used to name a condition of the gums frequently seen, and with which the writer has been battling since 1866, which was before any of Dr. Rigg's writings were published. During the last twelve years the amount of writing that has been done on this subject is quite voluminous, and the most of it reminds me very much of the steam that is seen emerging from the top of a scape pipe. The most valuable contribution on this subject is to be found in the American System of Dentistry, Vol. I., and which was written by our esteemed friend, Dr. G. V. Black.

The writer's treatment for this trouble consists of thoroughly removing all deposits and then applying finely pulverized sulphate of copper, which is caustic, astringent and stimulating. It has been my observation for many years that the most aggravated cases of this disease are found in the mouths of those persons who never eat pickles or anything sour, hence we are in the habit of recommending their use at meals and also the free use of lemons and oranges. In my humble judgment all such patients should be impressed with the importance of adopting an anti-scorbutic diet.

PLACING RUBBER DAM ON LOWER FRONT TEETH.

A slip-noose can be put on the lower front teeth with one hand, while the rubber dam is held down with the other; get the slip-knots ready first, draw them tight, and they will hold as long as wanted.

TRIMMING RUBBER PLATES.

In finishing plates always trim the rim low over the bicuspid, leaving it high as can be worn over the cuspids and the same over and back of the second molars; do not file rim to a knife-like edge, slightly bevel inside of rim at the top, extending down about three-sixteenths of an inch.

TO MAKE PLATINUM GOLD PLATE.

To make platinum gold plate, melt with blowpipe pure gold on a piece of platinum and roll to the desired thickness; the result will be as good as any you can buy.

GOLD SOLDERS.

Take a United States \$5.00 gold piece, 20 grains coin silver, 10 grains pure copper, 6 grains English toilet pins, melt the silver and copper together first; after melting this and the gold together, add the pins, flow into an ingot and roll, cut it into small pieces and melt again if it should not roll well first time; this will give a solder a little more than nineteen carats fine, and flows nicely on coin gold, being the same color.

TO SOLDER CAP ON GOLD CROWN.

To solder a cap on a gold tube intended for an artificial crown, lay the cap on about a tablespoonful of finely cut asbestos, put the tube in place on the cap, drop in the solder and a little

powdered borax, then blow a yellow flame all around the tube until the solder flows, and there will be no danger of melting the plate.

POLISHING INSTRUMENTS.

To keep instruments polished, use a material sold in wholesale jewelry houses under the name of diamantine; the method of using is to place a small quantity of the powder on a piece of thick spongy sole leather and rub the instrument on it, when it will soon take on a fine polish. This so-called diamantine is nothing more nor less than oxide of zinc, and can be bought in a wholesale drug house much cheaper than anywhere else.

To keep the rubber dam from jumping off a lower molar tooth, tie a small bead in the thread to be used as a ligature and apply around the tooth so that the bead will come on the lingual side of the tooth, and thus frequently avoid the use of a clamp, which is not admired by many patients.

PERFECT IMPRESSION FOR PARTIAL UPPER PLATE.

To take an accurate impression of the mouth for a partial upper set of teeth, smear plaster over the roof of the mouth with the finger, take a string about one foot in length, tie the ends together, put the tied end of the loop into the plaster on the roof of the mouth and add more plaster to thoroughly imbed the knot, leaving the loop of the string hanging down. In placing the plaster in the mouth care should be taken to have it come full half way over the grinding surfaces of molars and bicuspid and cutting edges of the front teeth; then trim the plaster and varnish the trimmed surfaces. The plaster should be so trimmed that it will fill up fully one-half of all spaces between the teeth; then cover all the remaining surface of the mouth and teeth with plaster, being very careful to have the teeth well covered and spaces filled in, putting on plaster for the buccal and labial surfaces. When set, the plaster impression readily parts where it has been varnished, the palatal portion is dislodged with the help of the string used, and the pieces are then placed together and the model made. If a tooth is irregular use modeling compound about it and trim suitably; then apply the plaster. When removing it breaks where joined; then remove compound, place in position in the impression and pour the model.

MODELS OF MARBLE DUST AND PLASTER.

In vulcanite work the best results may be obtained by making models one-fourth marble dust and three-fourths plaster; also same in flasking the case. The best plaster that I have ever used is that made by Mr. Higginson, at Newburg, N. Y. In the humble judgment of the writer the best and sharpest models are made without using varnish of any kind on the plaster impression; instead lather the impression with soap, which is readily done by wetting a camel's hair pencil and rubbing on a cake of soap and applying to the impression until it is covered, and then set it in a basin of water for a few minutes until the plaster has absorbed all the water it will take, when it should be held under the hydrant for about a minute to wash off the excess of soap; it is now ready for pouring or filling with plaster and marble dust to make the model, which when it has set sufficiently, can with the exercise of a little care be separated as nicely as if a thick coating of varnish had been used. In this way a sharp model can be made without obliterating any of the fine lines of the impression, which is one of the little things that should always be attended to at the proper time.

In all operations in dentistry it always pays well to attend to the little things at the proper time.

TO DUPLICATE MODELS AND IMPRESSIONS.

Take printers' roller composition, melt in a water bath until dissolved. Grease the model slightly with lard, and place it the same as if to mould a metal die, cover with a metal ring (a tin can opened at both ends will do), and pour the melted composition over the model. Let this stand over night. By morning the material is hardened and the model can be withdrawn. The composition being elastic it retains its shape, and a hundred models may be poured if necessary. Printers' ink rolls are made from glue and molasses.

Having to make a full upper set of teeth, we will suppose the impression and model to have been made in the usual way. Take modeling composition, soften and flatten it out until it is about a quarter of an inch thick; press it on the model while warm, and then cut and trim to make a trial plate for the purpose of taking a bite. It should accurately fit the model. Melt a little wax around the ridge, then press a roll of softened wax on that, and trim to

what you think would be a sufficient length, then try in the mouth and carefully trim the lower edge to the proper length for the teeth; if you find that it is not as desired, either add to or cut away until it is found by trying in the mouth that the wax represents the proper length. This wax should be so cut on its articulating surface that all the lower natural teeth will strike at the same time when tried in the mouth. Now remove and soften the articulating wax surface just a little over the flame, then replace in the mouth, and do not let the patient bite into it until you have the head drawn well back, so as to put the interior muscles of the neck on a stretch; then have the patient bite a little on the wax, just to get an impression of the cusps and cutting edges of all the lower teeth. Next take an accurate impression of the lower teeth, from which make a plaster model, which will fit into the slight impressions of the teeth made in the bite taken, and then place the whole on any good articulator which can be set to maintain the relative positions. Fasten the set screw, remove the bite and you are ready to set the teeth to a correct articulation, and if all has been carefully done the teeth will come together without any subsequent grinding.

For a double set (upper and lower) make trial plate of modeling composition to take the bite on, putting a piece of rather stiff wire in the lower one to stiffen it. Wax the ridges as previously described. Place a roll of softened wax on the upper trial plate, place the lower trial plate in the mouth, being careful to see that it is in its proper place, and hold it there while putting in the upper plate with the wax on it. Do not allow the patient to bite until the head is thrown back as far as you can get it; then tell the patient to bite, and keep the jaws closed until, with one finger, the wax has been well pressed on to the trial plates. Mark the centre or median line on the wax. Have the patient close the lips, and then take a small straight instrument and mark on the wax the height of the lower lip. This mark should extend from one angle of the mouth to the other; you then have the line of fissure or line of lip closure; in other words, the height of the lower lip and length of the upper to serve as a guide in making the wax models. After thus taking the bite, place each of the models in the bite so obtained, and fasten in any good articulator; then prepare the contour wax models, which should be tried in the mouth to verify their correctness. They should come together in the mouth the

same as on the articulator, and if they do not they should be made to do so before proceeding further. Take pains to be satisfied that the wax models are correctly adjusted and give a natural expression to all the facial features, observing that the lower third of the face is in the proper proportion or length with the upper two-thirds, and be sure to produce the proper fullness over the region of the upper cuspids, to give as near as possible the natural contour. Then take the upper and lower plaster models off the metal articulator, and make a plaster extension to the back part of the upper model, on which place the wax models, which have been marked while in the mouth. The lower plaster model is placed in position, and a plaster extension added to fit to that of upper plaster model. After separating these, the lower wax model is placed on the lower plaster model, and the inside space filled with wet paper, and plaster is poured over all to make the lower articulating plate to which the lower teeth are to be set. Next place the upper model in position, and set the upper teeth to the lower ones which have just been set to the lower articulating plate, and when ready for flasking, if for vulcanite plates, saw off articulating ends. In setting the teeth always set the lower teeth first. And in setting the upper teeth to the lower ones, set the bicuspid first.

Having made double sets in this way for twenty-seven years, without having to do any grinding after placing them in the mouth, the writer thinks that he has some claim to the conclusion that this method is a pretty good one.

When making an upper plate to articulate to lower natural teeth, always take an impression of the lower teeth, and in taking the bite have the wax trimmed to show the length you wish the teeth to be, and bite into it just sufficiently to show the tips of cutting edges and cusps, where the model made from lower impression can be placed in proper position, etc.

To keep rubber from running between the teeth and joints in vulcanizing, after the teeth are set in the first half of the flask, the plaster trimmed and varnished, pour water on all the teeth and joints, then mix a small quantity of pure plaster; have it rather thin and with mixing spatula cover labial and buccal surfaces, also joints, take up the piece quickly and bring it near the mouth and blow rather sharply against the thin plaster all round, which will force it into all spaces between the teeth and blocks. After this

finish flasking in the usual way and, if possible, it is well to allow the case to remain over night in the flask before packing.

To prevent plaster from adhering to the palatine surface of rubber plates, coat the model with a thick lather of soap just before packing the case.

To make rubber attachments adhere to metal plates (particularly gold), without punching holes or soldering pins and staples, clean thoroughly that portion of the plate to which the rubber is to be attached, using alcohol and chloroform to remove all wax or grease. After that scratch said portion over with a piece of new and clean sandpaper, next etch up the surface with a graver, being always careful never to touch it with the fingers or to blow the breath on it. Now with a hot spatula spread small clean pieces of vulcanite over the etched surface, using considerable amount of force until all of said portion of the plate is covered with the rubber, then finish packing the case in the usual way. When the piece is placed in the vulcanizer take half an hour to raise to 212 degrees, and from that point take three hours to raise to 320 degrees, after which allow it to cool slowly.

The greatest and most needed improvement in our profession to-day is in the line of prosthetics. In this age of progress of the arts and sciences of which so much has been said and written, and which we like to apply and hear applied to our profession, the writer is inclined to think that we can justly boast of our progress in everything else.

But alas, when we see wherever we go so many evidences of the low standard of this branch of dentistry, such disfigurement, such utter failure of any artistic skill without the appearance of any effort to restore the features. These false teeth are grinning at us at every turn. False did we say? Yes, false teeth everywhere; on the street, in the car, at church and in the social gathering. Their false appearance asserts itself like a horrible ghost, while the unsuspecting victim seems to enjoy their hideousness. Many of these miserable looking so-called substitutes have the magnificent hue or shade of well-watered skim milk, and looking about as much like human teeth as a row of small white beans set in the shape of a horseshoe.

If the poet or the musician could furnish nothing better, their occupation would soon be like Othello's. Now, what is needed is a systematic effort to instruct the people that they may know what

prosthetic dentistry can do for them. When they know or realize what an artistic denture is, there will be no difficulty in receiving ample compensation for it. No wonder artificial plates bring such a low price. They all look alike. Those placed in the mouths of old people being taken from the same job lot as those inserted for the loss of eighteen summers, and for this reason the more intelligent people have a perfect horror of them, and do not want to pay much for them. Any dentist who has practiced for any length of time knows what a marvelous change can be made in the features of a patient by removing an illy adapted plate, and substituting for it one well adapted in all its requirements.

ANCHORING LARGE CONTOUR FILLINGS IN INCISORS.*

By L. W. SKIDMORE, D. D. S., MOLINE, ILL.

From my observation of contour fillings I am led to the conclusion that we have in the anchoring of large contour fillings in incisors, where there is little penetration of decay toward the pulp, a class of fillings that seems to tax the ability of the average operator to perform.

I believe many of the failures in these fillings which we credit to soft teeth could be traced to improper anchorage.

While I have nothing new or original to offer, I think a mild thrashing of the old straw again at this time may not be in vain, so I feel no further apology is necessary for presenting this subject for your discussion.

The anchorage of all fillings which will be subjected to severe strain should be such as to protect them from any force that would tend to dislodge them from the cavity. The anchorage should be made as strong as possible without weakening the tooth.

There should be a strong square base at the cervical portion of the tooth for the filling to rest upon.

The plea that tooth structure should not be sacrificed is wrong and should not be considered. When a tooth is presented for our treatment the question to consider is, how can this tooth be put into the best condition to have it strong and lasting.

The question of saving this or that portion of a tooth we should not allow to prevent us from putting the tooth in the best possible condition for endurance.

*Read before the Illinois State Dental Society, May, 1897.

The usual method of preparation is after giving the usual conformation to the cervical portion of the cavity, the anchorage at the occlusal part of the tooth is obtained by drilling obliquely between the two plates of enamel toward the cutting edge of the tooth. See Fig. 1. This is the method of anchorage which I find so often develops a weakness, resulting in a leaky filling and the formation of a crevice at the line of juncture with the enamel.

Other unsatisfactory results will often confront the operator who depends entirely upon this method.

It is against persistent use of such anchorage I wish to protest, as I believe a better method can and should be employed, one that will save us many failures, and relieve us of the burden of telling our patients their teeth are too soft to hold the filling.

It is seldom sufficient in any class of cavities to risk the anchoring of the filling to what can be obtained by shaping the cavity as formed by the decay, but in order to anchor a filling so it will stand the force of mastication, it is usually necessary to extend the border of the cavity beyond the line of carious destruction and in these fillings I consider it very important. Having determined to involve the corner of a tooth in our filling, enough tooth substance must be sacrificed to allow sufficient gold to be packed into the incisal portion of the filling to resist the strain of mastication.

The cavity must have enough retaining shape to resist the strain.

Some writers recommend the cutting of an auxiliary dovetail upon the lingual surface, as in Fig. 2.

This is doubtless an improvement on the first method described, and may be sufficient in some cases.

In dealing with these cavities involving the restoration of the corners careful attention should be given to the formation of the cavity border, which should be free from angles. It should be a continuous curve, not a succession of curves, as irregular borders will produce weakness along the points of contact between the filling and the tooth and chipping of the margins will often occur while packing the gold, or if not then, you will frequently find it so in a short time afterward.

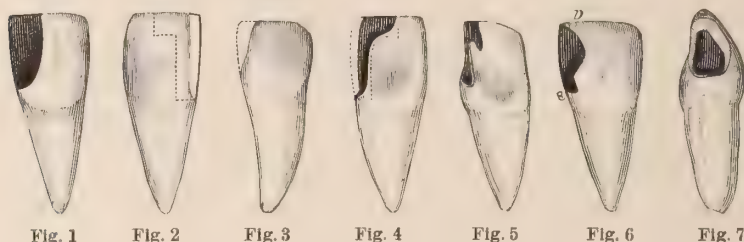
Such a filling we have represented in Fig. 3, and is a method of shaping the cavity border too often employed. We have the cavity border curved, but it is a succession of curves and they make a weak border for any filling.

The sharp point at A should have been cut away, for even if the filling should be inserted without causing a fracture at this point, the force of mastication is to soon break it away.

The deep cut B is also wrong, as the gingival border to be strong should be formed flat against which the gold can be packed without fear of fracture.

In Fig. 4 we have represented the proper curve which should be given to the cavity border in these cases and while it is stronger it is certainly more pleasing to look upon.

It also represents the gingival border properly formed. To more fully explain the method of anchorage, I wish to recommend, as it has given me the greatest satisfaction, take an upper central incisor, the whole mesial surface being decayed, with little penetration toward the pulp, and I would prepare it as I have shown



in the cuts Nos. 5 and 6. The cervical half of the cavity is shaped in the usual way, but instead of following the usual method of obtaining anchorage for the occlusal half of the filling by drilling obliquely into the cavity between the plates of enamel which gives us but a frail anchorage at best, one which is liable to fracture, resulting in dislodgment of the filling. I cut a groove leading from the cavity distally to near the center of the tooth, and in some cases I cut the groove entirely across the tooth.

This groove must be made deep enough and wide enough to hold a sufficient amount of gold to give the necessary strength to stand all the force which may be brought to bear upon it in the act of mastication, and it should be made slightly deeper at the point furthest from the cavity which will greatly assist in binding the filling in and more fully prevent its dislodgment.

Some may object to the labial plate of enamel not being protected more than represented, but by carefully beveling the cavity margin and building gold over, it will be fully protected.

In cases where the pulp has been freshly devitalized and the tooth healthy, the root canal offering such a place for good anchorage, would cause me to save as much of the crown as possible.

In cases where the pulp has been dead for some time and the tooth in a dry and brittle condition we will often do the patient, better service by replacing the old tooth structure by an artificial crown.

THE RELATION OF THE TEETH TO THE LIPS AND FACE.*

BY A. O. HUNT, D. D. S., CHICAGO, ILL.

By close observation and careful records, phrenology and physiognomy have been brought to such a stage of perfection, that by the outlines of the body combined with its movements, it is possible to tell the character and disposition of an individual, as well as what those characteristics fit them for in the way of occupation. Palmistry also, by the same careful observation and correct records can make some very close guesses as to those things which govern an individual, both past and present, by the lines, the hills and mountains as seen in the palm of the hand, in the shape and outlines of the fingers and thumbs.

Art and sculpture have by the same means been enabled to fix a classical standard of the ideal shape of the human form as seen in the external outlines on the surface of the body, exhibited by the position and action of the muscles. There has also been established a definite relation as to size in the circumference and length of parts of the body, as compared to each other.

The distance between the eyes, the length, width and position of the eyes, length of the nose, size of the mouth, etc., etc. And yet these features are so affected by their surrounding conditions, that the human family is divided into five distinct races of people, and again for reasons into tribal and national characteristics, still retaining all the essentials of the human form. Wherever the study of the human form has been specialized, both anatomy and physiology (form and function), have been well considered. It has engaged the best minds, and produced an extensive and valuable literature, such as Darwin's *Expression of Men and Animals*, Rimmer's *Art Anatomy*, various works on phrenology and palmistry, etc., etc.

*Read before the Illinois State Dental Society, May, 1897.

The subject here presented is one that I have been investigating for a number of years and demonstrated repeatedly the conclusions arrived at in a practical way in the field of prosthetic dentistry.

This investigation was based upon the belief that if the parts of the body had so many fixed relations to each other that other specialties had found a basis upon which to build, that the teeth must also have a definite relative position to other parts of the head and face. If this could be shown it would relieve the dentist of many discouragements and assist the beginner in mastering the most difficult operations with which he has to deal. Instead of his being obliged to wait for eight or ten years, or it may be longer before he begins to feel any interest in the work, or confidence in himself in the field of dental prosthesis, a set of principles might be established as a basis, so correct that he could proceed intelligently in the construction of an artificial denture, and without fear as to the final results.

The methods followed by which the conclusions were reached as presented for your consideration, was to make sets of plaster models of all classes of natural dentures, making at the same time, and of the same individual, two plaster casts of the lower half of the face; one with the features absolutely at rest and one where the teeth were closely occluded. Both being essential in the study of the subject, the casts of faces made in these two positions show some widely varying conditions.

Our interest is centered more particularly in the lower fourth of the face, or the maxillary region where most if not all of the muscles of expression concentrate.

The lips will demand our first consideration. I do not think it necessary to take up in detail each muscle and its function. You are all quite familiar with this. Into the orbicularis oris muscle anastomose all the elevating and depressing muscles; in the upper lip all but one are elevating muscles; in the lower lip all but one are depressing muscles. In the case of the one, the depressor alæ nasi of the upper lip, it is not so much a muscle of depression as one of eversion and inversion; that is, it will move the lip inward or outward, but not downward to any extent, while the elevating muscle of the lower lip has a very great function. In other words, it is with difficulty that the upper lip can be forced down over the lower lip, and in some cases it cannot be done at all; while nearly

every one can raise the lower lip over the upper one; sometimes to the extent of touching the base of the nose.

The lips assume many forms. The full lip, the thin lip, the flat lip, the pointed lip, the full upper lip and thin lower and vice versa. In fact the great law of variation is as constant here as elsewhere, and yet the change is never so great as to destroy the identity of the human characteristics.

The various changes of appearance are more apparent than real, as this appearance is controlled mostly, if not wholly, by the position of the teeth and shape of the alveolar process behind them. In following this investigation, if one expects to come upon anything that may be regarded as typical either in the arrangement, size, form or occlusion of the teeth, they are doomed to disappointment; outside of the fact that they are human teeth and cannot be mistaken, there is nothing else typical.

Let us first consider the cuspids, the most important of all. They have a position distinctively their own, and but little variation is observed in that respect. In their development the position of the follicles are above the line of the follicles of the incisors or bicuspid. Their position is directly underneath the ala of the nose, between the fibers of the levator labii et ala que nasi and the levator labii superioris. In the process of development and eruption they retain this position between the muscles, and when finally in position the cusps or point is in a line with, and directly underneath, the outer margin of the alae of the nose. The only cases where this is not true (and they are rare) is where in the premature eruption of the lateral incisor and first bicuspid the two latter have come into close contact at the interproximal space. If, however, this contact is not close and there is room enough for the wedge-shaped lingual side of the cuspid to gain an entrance, the cuspid assumes its regular position, crowding the incisors and bicuspid either within or without the arch, or in some cases causing them to rotate in their alveoli.

Another instance where the variation may occur is where they erupt in the palate bones, or they may be locked within the arch by the occlusion of the opposing teeth.

The mesio-labial margin usually forms the turn of the arch. The labial surface is presented mostly to the buccal aspect. The central and lateral incisors, unless some of them are abnormal in size (which is not unusual) occupy the space between the cuspids.

The variation in the relative width of the incisors is shown by the common irregularity as to alignment. It is very rare not to find them either slightly within or without the arch or some of them rotated in the alveolus.

The position of the bicusps is that they are nearly hidden behind the cuspids, if the median line is taken as the center of vision. In every movement of the levator anguli oris and the risorius muscles, inward pressure is brought to bear on these teeth. This pressure is augmented by the action of the levator and depressor anguli oris muscles, as well as by the anterior margin of the buccinator, in the act of opening the mouth. As the molars develop and erupt with the growth of the maxillary, they are farther removed from the action of so many muscles which changes the conditions materially. They are at liberty to follow the law of individuality which dominates all forms, and thus arrange themselves according to the temperament, whether basal or mixed in type.

The levator menti inferioris, the depressors labii inferioris and depressors anguli oris in the interlacing of their fibers present analagous forces to the muscles of the upper lip and cheeks, which operates to keep the inferior cuspids in their normal position.

The inferior teeth are not so likely to be malpositioned when the superior teeth are in their normal place, except at the time of the eruption of the third lower molars.

In considering the lower teeth, we find that the central incisors are always the length of the lower lip when the face is at rest. This is not likely to be the fact in the relation of the upper lip and upper teeth. Any unusual growth of the intermaxillary bones or a roundness or fullness to the superior alveolar border will cause what we call a short upper lip. The lip is shortened because when it is lifted above the rounded or full border of the process there are no muscles that readily act to bring the lip down over it; so much of an effort is required to accomplish this, that the individual rarely exercises it. The result is, that many persons do not close the upper lips when the face is at rest, while at the same time the teeth may be very nearly in contact and the occlusal margins of the superior central incisors are touching the inner edge of the lower lip.

The variation in the profile of faces requires that some standard be used to decide whether the lip and teeth are of the same length.

If an instrument be passed between the lips at the parting at right angles to the plane of the lower fourth of the face, it will touch the superior central incisors at a point corresponding to the occlusal edges of the inferior central incisors. If the teeth are separated slowly without disturbing the instrument or lower lip, it will be found that the point of the instrument will indicate the length of the lower teeth as stated.

The relation of the teeth to the lips and face are of such a positive character, that there could not be a good and beautiful face without a correspondingly good arrangement of the teeth. It is possible for a close observer to tell by looking at the outlines of a face without seeing the teeth, as to whether any of the latter are missing or out of position, and which ones are so.

If in the construction of artificial dentures the principles as presented are noted and marked upon the wax used in taking the "bite" and such other notes made as cannot be recorded on the wax, the element of guessing will be eliminated and the years of experience to obtain a good result will be shortened materially.

We have then the following as a summary :

When the face is at rest, the teeth are slightly apart.

The occlusal edges of the central incisors are touching the inner margin of the lower lip.

The cusps of the superior cuspids are in a line vertically underneath the outer alæ of the nose.

The length of the lower incisors is the length of the lower lip.

ANÆSTHESIA OF THE DENTINE*

By J. O. ELY, D. D. S., CHICAGO, ILL.

Since the title of this paper was handed in by your committee over a year ago, it has become a great favorite with a large number of dental writers and the practical details of the method of obtunding sensitive dentine by the process of cataphoresis has been described times without number. For this reason the writer will not present to you a detailed account of methods of procedure or quote individual cases from practice; but rather attempt to place before you for consideration the subject of cataphoresis as it presents itself to him after a year's trials and experiments.

*Read before the Chicago Dental Society.

It seems that as early as 1833 the principle of cataphoresis was known and used in France for the introduction of medicaments into soft tissues.

The *Lancet*, of London, notes its application in conjunction with aconite for the same purpose in 1859. In the same year Kempton, of London, used the method to anæsthetize the tooth and surrounding tissues for the purpose of extraction.

These early experiments seem only to have been used in dentistry to obtain a painless method of extraction.

As far as dentistry was concerned, the method seems to have attracted no great attention and there is little to record concerning it until in 1889 Dr. D. F. McGraw, of Mankato, Minn., now of San Jose, Cal., in a paper read February 5 at the twenty-fifth anniversary of the Chicago Dental Society, gave a complete description of his method of obtunding sensitive dentine. His description of the method I quote as follows:

"First apply rubber dam. Wet a pledget of cotton in a solution of cocaine and alcohol, pressing the point of positive electrode into the cotton in the cavity and the negative electrode with sponge attachment, thoroughly wet, to the cheek and turn on the current. Rarely will more than four cells be necessary." This is the method in use to-day by the profession, with unimportant changes.

Dr. T. E. Weeks, of Minneapolis, read a paper on obtunding sensitive dentine at the same meeting, in which he said: "I have used this method of Dr. McGraw's for obtunding sensitive dentine and demonstrated to my entire satisfaction that the application of cocaine and alcohol by electricity does anæsthetize the pulp, as I have removed ten pulps, all with little or no pain by this method."

Six years later Dr. H. W. Gillett, of Newport, R. I., again called the attention of the profession to this method in a paper read before the American Dental Association, August 8, 1895, six years after Dr. McGraw had described it fully before the Chicago Dental Society.

To Drs. Gillett and Morton great credit is most certainly due for their work on this method and their most able presentation of it to the dental profession; but the tendency of recent writings to ignore Dr. McGraw in this matter is most certainly doing a great injustice to a man who, if written records are reliable, first presented this method to our profession in a practical form.

For sixteen months the writer has been using the electric current in conjunction with cocaine to control the sensitiveness of dentine and for other purposes.

The experiments have been of the greatest interest to himself and in the large majority of cases has convinced his patients that the era of painless dentistry is at hand.

The electricity used has been obtained from 110 volt Edison current. For the control of the current, he constructed first a water rheostat, and later an appliance somewhat similar to that suggested by Dr. Custer, of Ohio, by means of which a shunt current is used. I have been using for some time the cataphoric outfit for 110 volt Edison current. It is the most perfect apparatus of its kind I have yet found. The current is under complete control and the appliance is so simple that a child can operate it with perfect safety. Any one who has access to a 110 volt current can use it or it can be used in connection with a storage battery. I much prefer an appliance that uses the Edison current as will be easily understood by those who have used the storage battery and have been subjected to the annoyance of keeping it in order.

I do not dread the reversal of the current mentioned by some writers as I have never found the current reversed during sixteen months of constant use.

The manager of the Edison company asserts that such an occurrence is extremely improbable, while the danger from a sudden and great increase of current, such as would result from crossed wires, is almost an impossibility, all wires being under ground. In operating by this method the rubber dam should always be applied at commencement of operation.

Extreme care should be used in insulating all metals, either clamps or fillings near the cavity to be operated upon, for which purpose I use chloro-percha. I am confident that a large number of failures by this method are caused by a dissipation of the current through improperly insulated clamps and fillings.

Holding a pledget of cotton in the cavity by means of an insulated instrument, held by the hand of the operator, is another cause of partial and often complete failure. Frequent shocks by such a method are absolutely unavoidable.

By wrapping a No. 31 platinum wire around a pledget of cotton and forcing same tightly into cavity, then holding wire in place by imbedding in a drop of sticky wax on an adjoining tooth

or clamp is a method I have used for eight months with perfect satisfaction. It prevents all annoyance from shocks caused by moving cotton in cavity or breaking the current. As the drug only acts on that part of the tooth with which it is kept in contact, to be successful we must have perfect insulation and perfect contact.

A number of different drugs have been used, but there does not seem to the writer to be as great a difference in their effects as some writers are urging.

A 20 per cent solution of hydrochlorate of cocaine in water has been most frequently used, but of late have been more favorably inclined to the use of a 20 per cent solution of hydrochlorate of cocaine in electrozone.

Some experiments were made with eucaine but the results were not such as to give great hopes of its being more valuable than cocaine.

A solution of cocaine in guaiacol also failed with me in giving the remarkable results that have been claimed for it. I think there is a very interesting field open here for experiments and I hope before the year has closed that some advance will be made along this line.

I now use a solution of cocaine and electrozone and find it reliable and satisfactory, making it fresh each day.

On the advantages of cataphoresis as compared with other methods of obtunding sensitive dentine, it is hardly necessary to dwell, for while an occasional operator may be found who has developed some special method or process that will in his hands, in an uncertain proportion of cases give good results, yet in 95 per cent of cases operated upon by cataphoresis I know just what the result will be. I know that within a few moments I can produce absolute insensibility of the dentine, and if necessary, of the pulp by prolonging the operation. The knowledge that no pain is to be inflicted in cutting and drilling a sensitive tooth robs the visit to the dentist of all its terrors, if not of its annoyances, and the dentist no longer dreads the visit of that class of nervous patients, who now make such a drain on his vital powers. Operations that formerly had to be slighted on account of the inability or unwillingness of the patient to endure pain can now be performed under such favorable conditions that the degree of perfection attained in each operation is limited only by the skill of the operator. But is there no danger in the use of this method? I hope there will be a full

discussion on this point. Will not hyperæsthesia frequently follow this operation? I have seen it in only two cases out of three hundred, and then was not at all certain as to its cause.

The malleting on these two teeth seemed as likely to have caused this trouble as the use of the cataphoresis. Some dread the toxicological effects of the cocaine. I have as yet no indications whatever that the influence of the drug has extended beyond the foramen of the tooth upon which the operation was being performed. Objection is made that the operator is likely to encroach upon the pulp if the dentine is made insensible to pain. I think this objection is well taken, but found that one exposure made in this way was sufficient to correct any desire on the writer's part to see how deeply he could cut. After a long and thorough trial of the method I know only one disadvantage, and that is the time involved. This is commonly rated as a great drawback to the method, but I think unjustly so. As a rule, writers on this subject seem to me to be rather underestimating the time required to sufficiently obtund the dentine in order to make the operation a success.

In very exceptional cases have I been able to perform this operation in five minutes; in very few cases has the time been under ten minutes, and in the majority it has been fifteen or over. As a result of my experiments, I am forced to the conclusion that in the present condition, and in our present state of knowledge, fifteen minutes is under rather than over the average time required for producing the desired result. Although apparently it requires a long time to properly obtund the tooth, yet it takes a very few moments to prepare the cavity when the patient feels that the operation is to be painless.

Any dentist who adopts this method can easily arrange his appointments and offices so that it will be possible for him to do even more work, rather than less.

Sum up conclusions as result of 300 operations:

As the result of 300 operations and sixteen months' experience with cataphoresis, the writer is convinced that in the hands of the careful operator it is one of the greatest blessings ever given to the profession; that it can be applied to 90 per cent of sensitive cavities, and that it is successful in 95 per cent of the cases in which it is properly applied.

That there is no destruction of tooth or pulp tissue.

That there is no danger of injury to gum tissue if it is properly insulated and a high voltage is not used.

That fifteen volts is sufficient to produce the required results.

That properly performed, the production of partial or complete anæsthesia of tooth or pulp should be accomplished without pain or discomfort to patient in any way.

That all patients without exception have been more than willing to pay the additional cost when the length of operation was increased by the use of cataphoresis.

That it is of great benefit where it is necessary to remove or destroy pulp, for by its use the pulp can be removed absolutely without pain.

That as a result of its use patients lose completely their fear of dental operations.

That from our professional life the nervous strain is almost entirely eliminated.

That the proper preparation of cavities is no longer prevented by nervous fears or suffering of patient.

Lastly, that dread of the operations being removed from minds of patients, necessary work is no longer neglected by them, and teeth will be kept in much better condition than at present.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

DISCUSSION ON DR. SMITH'S AND DR. SKIDMORE'S PAPER.

Dr. C. N. JOHNSON, Chicago: *Mr. President:* I think I shall have to take off my hat again to the young men. I am much gratified with this paper, because it is the beginning of an investigation along lines that I believe will lead to more definite results in regard to our manipulation of gold. It is an investigation of the same subject, along a slightly different line, that Dr. Black studied in the physical properties of gold.

I want to say a word or two in regard to the nomenclature of this subject. If we are going to accomplish the best results in dental literature we must have more uniform and definite terms to use to convey our meaning. The essayist has used the terms em-

ployed by nearly every essayist, by dental manufacturers, in designating different kinds of gold—"soft and cohesive." I believe those terms should be left out of our literature, and that the terms should be definitely "cohesive and noncohesive." I am sorry that this term "soft gold" sticks to the literature of the profession. It is not a definite term; it does not convey what the essayist wishes to convey. The dental manufacturers have almost forced us to continue these terms by placing them on their product. We may have a gold which is to all practical purposes soft and still it may be cohesive. As a matter of fact, cohesive gold is softer than noncohesive. You take a piece of plate gold and anneal it to make it soft; the same with a piece of foil gold, you anneal it, and that foil is softer than it was before. The reason that the terms soft and cohesive were used is because a fillet of annealed gold is more "sticky" under the plugger and the mass is not so easily manipulated by pressure as the noncohesive. But the term soft is a wrong one, and I am in hopes the profession will discard it in the new nomenclature. We have been indefinite in our phraseology and have not conveyed the meaning we wish to convey on account of this indefiniteness.

As to the use of noncohesive gold along the cervical margin, as advocated by many members of the profession, it is used in such a place, not so much because we cannot get adaptation with cohesive gold, but because in placing a layer of noncohesive gold and condensing the cohesive gold upon it, we have a cushion for the cohesive gold to be condensed on and can mallet over that part of the filling with less danger of injuring the enamel margin than we could if we started with cohesive gold and began our condensation in the early part of the operation. That small piece of noncohesive gold serves as a cushion to protect the margin from injury from the malleting force. I agree with the sentiment of the essayist, that we do not want to use much noncohesive gold in building up proximal fillings in molars and bicuspid. The only noncohesive gold I would use would be the first layer. From that point up I would use cohesive gold on account of its greater density. But I do not want at this time to enter into a discussion of the relative merits of noncohesive and cohesive gold.

As to the methods employed for testing the relative merits of mallet force and hand pressure, I am glad the essayist has started this line of investigation. I would suggest to him, however, in

pursuing this work further, which I hope he will do, to aim at greater definiteness and more accuracy as to his manner of doing these things and make a record of them. The small things in the manipulation of this material seem unimportant to the man who is doing them, but every little movement made is of importance in the final result. I would suggest to the essayist, in following out this line of investigation, that he measure the amount of force which he uses in his hand pressure—follow that out definitely, as well as measure also the degree of the blow that is used, and then by counting the blows and thrusts as they are delivered, he will be able to tell by which method the greatest amount of force is necessary for a given condensation of the filling.

As to the relative merits of hand pressure and the mallet force. This paper is very encouraging to us for this reason, namely, that by virtue of necessity we have been obliged to put in gold fillings by hand pressure. There are cavities so remotely situated that we must rely on hand pressure for the insertion of the gold, and, as I said before, it is encouraging to note from these investigations the efficacy of the condensation of gold by hand pressure. In my practice I have had a diametrically opposite experience to the essayist. In my first manipulation of gold I inserted it by hand pressure, and did this for a year or two during my early practice. The conviction began to come to me that I was using more force on my fillings for a certain degree of density with hand pressure, than I could get by the mallet blow. These experiments may disprove my impressions, that with a given force by the mallet and hand pressure we get a better condensation with the mallet than we do by hand pressure. To my mind, it may be illustrated in this way: If we are going to drive a nail into a board, suppose we put a hammer on the nail and press upon it slowly, it would require enormous pressure to force that nail into the board; but if we strike the nail with a blow, in it goes. I think this is a good way to illustrate the relation between these two processes. In any event, I believe we can get a greater degree of density to a filling, with less aggregate amount of force with the mallet than we can with hand pressure. Of course, this impression may be erroneous, and it remains for future investigation to measure the result of the force of hand pressure which is used in the insertion of a given filling, and the degree of force that is used with the mallet. There is one point in this connection which I think is

worthy of consideration, and that is the kind of mallet the doctor has used in his experiments. I have not used the automatic mallet in recent years at all, and so far as delicacy of manipulation is concerned, we get greater delicacy with the hand mallet than with the automatic mallet. The objection he has made to the automatic mallet is a good one. It is a clumsy instrument for any kind of work where precision is required, as well as nicety of adaptation or application. I would like this series of experiments regarding the use of the hand and automatic mallets, and all of these various appliances carried out and the results given.

In regard to the soreness and loosening of teeth from malleting, of course we must consider the comfort of our patients in every way possible, but ordinarily, if we hold a tooth steady while malleting the filling, we can do so without any perceptible degree of soreness. If we leave a tooth unsupported, when we strike a blow it is driven into the socket, the membrane rebels, forces it slightly out, and then we drive it in again with the next blow, until we get the membrane sore and inflamed. We can avoid that by holding the tooth perfectly firm, so that there is no driving in and out of the socket of the tooth in malleting.

One thing strikes me in these slides as I examine them. The failure of good margins might have been due in this instance to either one of two things, the form of the plugger, or the fact that the glass was fastened tight to the margin. When a matrix is placed on a tooth it should be so adjusted that we may force the matrix away from the margin and carry the gold between the margin and the matrix, so that from these slides we must not judge the doctor's ability as a manipulator of gold, nor his ability to cover margins perfectly in the mouth, because he was operating at a serious disadvantage from that one fact.

Another point is with reference to the form of instruments, and I wish he would tell us more definitely what instrument he uses in different cases. I understood him to say that he used a round pointed plugger, which is not the proper form of instrument to insure good adaptation along the angles of cavities. We need a plugger that will follow the outlines of the cavity margins. A round plugger with a flat end is not effective either in experimental work or in the mouth. These instruments are well enough for building up the filling, but not to protect margins.

Another point which impressed me in connection with

this investigation was, that there are several things to be considered in the proper insertion of a gold filling. We want density of the filling in order that it may sustain the force of mastication; but above and beyond that, we want adaptation to the margins to prevent leakage. The densest filling conceivable is almost useless if it leaks.

I do not want to consume the further time of the society. I simply wish to say in closing that I have been encouraged by the line of investigation the doctor has started on. I hope he will study the points that have been brought out more closely and precisely, so that we may get from him on a subsequent occasion a definite statement of every detail of the operation. Of course, he understands and is familiar with every detail, but judging from the questions that have been asked regarding these slides, several of the members seem to have been confused from a lack of minute description of the operation. Possibly the essayist neglected to give a minute description for fear of tiring the members. But the fact of these questions being asked, proves to us that we must go definitely into every detail. I hope the paper will bring out a full discussion.

Dr. R. M. PEARCE, Rock Island: I think the method referred to by the essayist in Fig. No. 1, is the one which is pretty generally advocated. In No. 2, I think if he would cut or make a step of the cavity and do away with the point it would be far preferable. The method he suggests in Nos. 5 and 6 is more nearly my idea, although in Fig. 6 I think we ought to cut deeper on the lingual wall making it thicker and consequently stronger, so that when filled it would better stand the force of mastication than it would in a more narrowed condition.

Dr. J. E. NYMAN, Chicago: I believe the essayist made the statement that noncohesive gold could not be made cohesive, and vice versa. In this he is mistaken, any of the noncohesive foils, with one exception, which is not a pure gold foil, can be made cohesive by continued annealing, and all of the cohesive foils without exception, can be made noncohesive by exposing them to the fumes of ammonia.

Another thing he said that cavities in which the gold filling was condensed by hand pressure took a larger amount of gold to fill them than the cavities in which the gold filling was condensed by the mallet. My criticism of this point is that he does not know

whether he got more gold in such cavities or not, simply for the reason that pellets of gold are not of the same size, and he has based his estimates on the number of pellets put in. If he wants to know about that, the gold should be carefully weighed before it is put in as a filling material, and the weighing apparatus should be of the most delicate kind. This is the only way one can tell whether he has more gold in one cavity than another. Gold pellets vary in size and weight, even if taken out of the same bottle.

With reference to hand pressure, I used to be something of an oarsman. I have a strong forearm and wrist and hand. I have used hand pressure in my dental work, and I wish to say that hand pressure unnerves, to say nothing of tiring one, and I have had the disagreeable feature of cramps in my fingers and hand when I have used it for any length of time. Another point. There is danger constantly, where we use a plugger with a curve near the end, of that plugger slipping and twisting and sliding out of the cavity through the rubber dam and lacerating the tissues. When you use hand pressure your patient is in constant fear that your hand is going to slip. I have had patients tell me that they were almost afraid to draw their breath for fear I go through their cheek with the plugger. When one has used hand pressure for a considerable time he loses the delicate sense of touch, so that he does not know exactly what pressure he is using.

Hand pressure, the hand mallet, the automatic mallet and engine mallet can be used to advantage in various parts of the cavity. I use the automatic mallet very little, yet some patients prefer it to anything else, because they know I am going to use same blow each time. With it one can deliver a very delicate blow.

Another point. I suppose you are all familiar with the Bosworth right angle mallet, which is one of the nicest instruments I have got in the office. You can deal a fixed blow with it every time, and there is no danger of it slipping. It can be used to advantage in the deeper parts of proximal cavities in bicuspid and molars. You can deliver a direct blow with this instrument that you cannot with any other mallet. The same holds true in a buccal cavity. You should strive for as thorough condensation as you can get by mechanical means, with the blow as uniform as possible.

Dr. S. F. DUNCAN, Joliet: In regard to the use of the automatic mallet, I have used it a good deal in my work, and I have

also used the hand mallet. I find as I look at my fillings that were put in a little while ago with the automatic mallet, that they do not seem to pit so badly as those that were made by the hand mallet and they do not become rough on the surface. I do not know why, unless it is due to the uniformity of the blow. I suspect that is the case. The fillings I have in this way inserted retain the finish better than those I put in with the hand mallet.

Dr. G. NEWKIRK: I simply wish to say that Dr. Noyes has had considerable experience in filling steel matrices with Dr. Black, and I think he can give us some pointers.

Dr. EDMUND NOYES: I made only two fillings in steel tubes; that is the extent of my experience. One of them was made with a fine point and with very heavy malleting and the minutest care, with a result which made the filling material heavier than the corresponding lump of gold run into the ingot, but not quite so heavy as can be obtained by passing gold through heavy rollers. The other one I made as rapidly as I could with much larger points, and a result that was less satisfactory upon the surface. I cannot give the details of relative appearance and weight, and nothing that I could say about it would add anything to the significance of this discussion. It has been suggested once with a great deal of truth I think, that the packing of gold against a smooth and flat surface, like a glass matrix, or into an angle like the one represented in such a cavity, cannot possibly be done best with a round point. It is a matter of mechanical stupidity to say that as good work can be done against a flat surface or into a sharp angle with a round point as with a square one. If you have a round hole to put gold into you may use a round point with which to put it in there. If you have a flat side you want a flat sided plugger to fit against it, if you wish to get close adaptation.

Dr. W. H. TAGGART, Chicago: I wish to controvert one assertion Dr. Smith made in regard to the use of one instrument for packing gold, and that was the rapid blow of the instrument. There are some arguments against it, but I think when one becomes conversant with the uses of the instrument, the objections dwindle to nothing. The modern kinetoscope, which gives us a continuous moving picture, is made upon this plan. We get the idea of the moving picture from the fact that the eye is capable of receiving so many impressions per second; in other words, the optic nerve is capable of receiving forty-two impressions per

second, and when it does this it gets to be a moving picture or figure. You take in the direction of vibrations in other ways. One set of vibrations causes a noise, a disagreeable sound; a higher number of vibrations will cause a musical sound, which is pleasant to listen to. Now, let us take the matter of malleting gold into a tooth, and we find a certain number of slow blows will create an impression of discomfort every time. Increase the number of blows enough to get rid of the disagreeable sensation. If you hit ten blows instead of one, you get ten times that amount of discomfort; but when you go beyond where the nerves of sensation are not capable of carrying individual impressions to the brain you get a pleasurable sensation, rather than a disagreeable one. You carry the impression to the nerve, and the nerve becomes paralyzed, so to speak, and is unable to carry the sensation of discomfort to the brain, on account of the number and rapidity of the blows. Take a mallet and run the number of blows up to two or three thousand per minute, and it will not give so much discomfort. The pain is nothing. The pressure is more steadily given, and there is no possible chance for the patient to describe the individual blows. It is a good idea to fix the attention of the patient on one particular point, as for instance, tell him to try and count the number of blows, and in this way he will get rid of the discomfort. A statement like this may seem a little foolish to some of you, but there is some good in it. If your patient cannot count the blows, ask him how near he can do it. Fixation of attention will draw their minds away from the disagreeable part of the work and the noise, and the vibration becomes comparatively nothing.

DR. EDMUND NOYES: If I remember correctly, the essayist stated distinctly it was not his object to find out what sort of surfaces and margins we got to our fillings, but to find out approximately what sort of adaptation we could get to the interior walls and corners of cavities which are out of sight. In doing this he has undertaken a task which is more difficult than the one which we have practically against the angles of cavities, because the surface against which the material comes has a sharper angle both at the side and bottom, and it is questionable whether it were easier to make a perfect adaptation against a smooth surface of glass or steel, than a smooth surface of dentine. His task was a more difficult one than a practical operation in a tooth, certainly

in regard to the sharpness of corners and angles, which are the things a photomicrograph brings out distinctly in the picture.

Dr. GARRETT NEWKIRK: I wish to suggest that probably a larger and flatter instrument for condensation would have produced a more even result than a fine pointed, choppy instrument did. That seems to be indicated by his own description of the instruments used. None of the instruments were really coarse, but the larger ones produced the best results.

Dr. SMITH (closing the discussion): In the first place I want to express my sincere thanks to the gentlemen who have discussed my paper for the kind manner in which they have handled my subject. My object in bringing this subject before the society was to get as free a ventilation of it as possible, and I had no idea what a task I had undertaken.

Dr. Johnson was especially kind in his remarks, and I want to thank him for them.

Regarding the remarks of Dr. Nyman, if it is not proper to make a cavity margin as near a right angle as you can possibly get it, then the teachings of Dr. Black, Dr. Ottolengui and others heretofore have been wrong. In regard to the amount of gold used in a particular cavity, or more in one than in another, I must say that the suggestion of Dr. Nyman in regard to accurate weight is a point that I fully appreciate.

I had no idea of the amount of work necessary to make all of these fillings, or the delicate manipulation required to pursue these investigations.

In regard to the discomfort and fear of patients in connection with filling teeth by hand pressure, I do not believe any of us should do these operations until we have gained the confidence of our patients, which is a thing we must have before we can do anything. My patients have no more fear of my instruments slipping and lacerating their mouths than they have of not getting their bill.

Relative to the sense of touch, Dr. Nyman looks as though he might have been a most expert oarsmen and a credit to any crew that ever rowed, but with all due respect to him, I do not think that the strongest man who has ever wielded a hammer or sledge would tire me out in putting in fillings with hand pressure. I have warts on my fingers where my instruments come simply from long-continued exertion, but it took me some time to become accustomed to this kind of manipulation.

The Bosworth mallet is a most excellent instrument in some cases, but it is not adapted to fillings in the buccal surfaces of third molars such as I had especial reference to.

In regard to Dr. Taggart's remarks and his illustrations with reference to the modern kinoscope, I will say that as yet we have no means of determining how many vibrations or beats to the second it will take in hammering gold before nerve sensibility becomes numb. This brings me back to what Dr. Johnson said, namely, we must investigate this thing, and find out how many pounds of pressure it will take by each process to reach a certain degree of condensation. I am appalled at the inadequacy of my results. They show very little and have established nothing conclusively. I have simply ventilated this subject and gotten you to think about it. I thought I knew something about this once, but I see now that I do not.

With reference to the condensation of gold, as far as I have been able to judge, in our practical work in the mouth, we get holes in our gold, no matter what form of instrument or condensation we use. We are going to figure this out some time and it seems to me we are going to get definite knowledge on the point as to whether it is best to have a few big holes, or whether it is best to have a lot of little ones. (Applause.)

DISCUSSION ON DR. TEMPLETON'S PAPER.

Dr. EDMUND NOYES, Chicago: It has not been so common in recent years, as it was when I first became a member of this society, to have papers of this character read, namely, respecting items of personal habit and practice, details of operations, and the various methods of manipulation. I will not deny that the papers and discussions which we have now are of more importance, but if we could spare the time it would still be very useful for the young men, and for the old men, to listen to items of personal habit in practice, which are apt to be different with different men. In this way and with such persons, men are able to give us what we might call tricks of manipulation and detail in making operations and in using appliances.

Dr. Templeton referred to one or two points which will admit of a little more explanation. In the first place, in respect to the use of hand instrumentation as against the engine in the preparation of cavities and filling them. He simply intimated that it

would be better for most of us if we used more hand work and less engine work. This subject should be elaborated in more detail, so as to discriminate as to just what work is best done with the engine and what is best done with hand instruments. I will say, to begin with, that no man can afford to allow himself to use the engine exclusively, because by so doing he would lose his skill and training in the handling of hand cutting instruments. In a general way, I should roughly express the opinion that dentine can usually be rapidly cut with the engine instrument, and the enamel can usually be rapidly split off or shaved with hand chisels. There are probably numerous exceptions, or some exceptions at least, but as a general statement I think you will find it correct.

In some of this work for the extension of cavities in sound territory for the safety of the operation which has been described and spoken of, it is my impression that sometimes it can easiest be done by a rapid undermining of the enamel, where we wish to extend the cavity, with a small and sharp bur in the dentine, cutting as little dentine as possible and getting rid of the enamel which is undermined by hand work with chisels, instead of trying to cut the enamel with burs. That is one suggestion. But there is a field here for somebody to work out scientifically, and, in fact, the whole question of instrumentation needs careful study and treatment; it needs much more attention than has been given it heretofore, particularly with reference to the shaping of cavities in teeth. Dr. Templeton told you how to make a water-tight gutta-percha filling. It has been suggested as a part of this manipulation, that the great portion of the shrinkage of the gutta-percha takes place before its plasticity is lost, which implies that the instrument he speaks of using should be used for a little time until most of the ordinary shrinkage of the material is over, and the manipulation has gathered it into the cavity to overcome it. The essential thing relates to the adhesion of the material to the varnished wall, so that the shrinkage which does take place will pull in the surface instead of pulling away the margins.

He has told you something about how to hold the rubber dam with beads. The beads should be tied on the tooth before the rubber dam is put on; you can stretch the rubber down and get it over one first, then the other, and it will stay there, giving opportunity to force it down into the proximal spaces afterward. Not many of you will use these almost to the entire exclusion of

clamps, as I do, but you will find in a good many cases that they will promote your comfort and that of your patient, and will abundantly pay for the enlargement of your resources by the use of them. The little white rounded porcelain beads are best. A glass bead is just as good, except for their transparency, which is not important. It should be round, and not broken off from a tube like those that were shown this afternoon. I will say, I heard some one in the room speak of the difficulty of getting them on. There are few teeth, even if they are newly erupted twelve year molars, upon which you cannot get a string with two beads, and tie it low enough so that it will stay.

One point in connection with what the essayist said about taking ordinary impressions when there are teeth remaining. In addition to the manipulation which he described, the teeth should be lubricated with vaseline or oil, so that the plaster will not stick to them. Probably you are all accustomed to do that. Able practitioners think about little details that may be of interest to other people, and as this is a subject upon which we should get points of interest from a great number of the members, I shall not consume any more of your time.

Dr. S. F. DUNCAN: Dr. Templeton spoke about the attachment of rubber to gold plates. He spoke of spreading it over the etched surface with warm instruments, if I rightly remember. The benefit he derives from this is in keeping moisture away from the plate. I have found by taking ordinary vulcanized rubber and making a solution of it in chloroform and covering that portion of the plate to which I intend to make the attachment, it would prevent the rubber from pulling away from the plate at the margin—the grinning, as I have called it sometimes, we frequently see in plates of this kind. This has been more successful in my hands than any other method I have tried.

Dr. G. D. SITHERWOOD: I am very much interested in Dr. Templeton's paper. I have known him for a long time and have learned many practical points from him.

With reference to taking an impression in plaster for a partial plate, or in taking a full impression of the teeth, I scarcely know who is the author of that method. But I have learned it was Dr. Angle's method of taking an impression of the teeth, which consists of using a clean impression cup evenly filled with plaster leaving but little surplus, and wait until your plaster has set

hard; then slip the cup off, it having been oiled slightly, leaving the plaster all in the mouth. Two grooves are then cut in the hardened plaster on a line parallel with the cuspid teeth, not cutting quite through. Then with a quick pry with a pointed spatula or knife the anterior piece is wrenched loose. The lateral pieces are broken off with the thumb and finger. The large piece covering the roof of the mouth may readily be worked loose. Then you have four pieces which are readily united.

I have sometimes thought that I could absorb more practical things from other dentists than any other man I know anything about, and could think of fewer things myself. I learned one thing recently while in Iowa from Dr. Peterson. Perhaps many of you know him. I will give it to you. In regulating teeth you often find the superior central incisors standing apart, especially where the lateral incisors are out of the arch. If you have a case of that kind in your practice, if you will go home and dry these teeth clean, then take No. 25 linen thread, wrap it carefully around the teeth three or four times and tie it, you will be surprised to find those teeth are together the next morning, or at the end of twenty-four hours. The philosophy of it is simple, the contracting of the wet thread brings the teeth together. It is the best method I have ever attempted in cases of this kind. The teeth, if they do not remain together, can be made to do so by making little bands, soldering them together, cementing them on the teeth, and you will have no further difficulty.

Dr. C. S. CASE: As early as 1882 or 1883, in the University of Michigan, students were taught to take impressions of mouths, similar to the method described by Dr. Sitherwood. Removing the impression cup, leaving the plaster in the mouth, cutting sections in different parts, and breaking it away to be restored in the cup. This is not what the author of the paper intended to speak about, if I understood him. It was with reference to taking impressions in plaster in difficult cases for partial dentures. It has nothing to do with the other method at all and cannot be done in that way. I do not think it advisable to take an impression cup for full denture and fill it with plaster, put it into the mouth of any patient, with the view of removing the plaster by cutting sections. The way to do this perfectly is by taking it in the first place in sections. Any one with a little ingenuity can place plaster on pieces of thin lead or anything you please, adapted to the

parts in sections, and take a sectional impression that will produce a perfect model of the parts, no matter how difficult of dovetailing the position of the teeth.

There was one thing said in the paper that I do not agree with, and that was the doctor's method of constructing solder composed partly of toilet pins or any alloy, the composition of which we do not exactly know. If we are going to do anything of this kind, why not do it on basic principles. Use chemically pure metals, pure gold, pure zinc, pure tin, pure copper, and put them together in proportions that will flow at a temperature a little below the the metal you are to solder.

Dr. G. D. SITHERWOOD: In reply to the remarks of Dr. Case, I only wish to say that I did not give my method of taking impressions or the other method of taking impressions in plaster and taking it away in four sections as being original or new. I stated that I have tried many methods more successful in my hands for taking such impressions.

Dr. LOWRY, of Kansas City: I want to speak of one or two points that occurred to me while the gentlemen were discussing the paper, and first with reference to the use of clamps. A great deal has been said in this connection about the use of the bead versus the use of the clamp. I use clamps in my practice pretty largely for several reasons. I am very careful to select a clamp that will fit the tooth that I expect to place it upon, one that will not impinge upon the gum. This can be done, the clamp holds the rubber out of the way. It admits more light upon the tooth or within the cavity than the bead method. The consensus of opinion seems this afternoon to be that the clamp ought to be supplanted entirely by the use of beads. I think the bead method is a fairly good one. In many cases it can be used conveniently; I use both and have for a long time. A small cube of ordinary rubber seems to hold the rubber down better than a bead; it is not so apt to slip off if applied to an upper wisdom tooth for instance. Rubber sticks to rubber better than to a bead. I use clamps with care. As I said before, the principal advantage to be gained is to hold the rubber out of the way and to admit more light to the cavity.

With regard to sectional impressions spoken of by Dr. Case, I have tried the method referred to; others may be more skillful than I in handling plaster of Paris. I find sectional impressions a

failure; I have never seen an accurate fit made from a sectional impression. If I want a perfect impression, or as nearly perfect as can be procured, I use plaster of Paris, pure and simple, place it in the mouth and remove it before thoroughly crystallized; it thus breaks easily and a series of clean-cut breaks can be replaced more accurately. After it has become thoroughly crystallized than sections. Although it is old, it is superior by far to the sectional impression method.

With reference to the use of the hand instrument versus the dental engine, would say in my opinion the dental engine is used too much. I can make an undercut in a sensitive tooth with less pain with a sharp, hoe-shaped excavator than with the engine, no matter how sharp or how small the bur; never reverse the motion however. I use the force in one direction until finished.

Dr. Templeton dwelt longer on the subject of prosthetic dentistry than any other part of his paper, and I was glad for it has not recently been given the care, attention and significance that it deserves. A good prosthetic dentist must not only be a mechanic, but an artist of the highest degree as well as a thorough anatomist, especially must he know the muscles surrounding the mouth and their various functions. It requires more skill to construct a good artificial denture than it does to make a bridge or crown, or to insert a filling of any sort. A dentist must have a greater diversity of qualifications in order to be successful in plate work than in most any other branch of mechanical dentistry, or of dentistry of any kind.

Dr. E. T. BRIGHAM, Watseka: The few words I shall have to say will be in line with the subject of the paper and the discussion. The paper was somewhat assorted and the discussion seems to be in that line. I believe the right way to take an impression is to do it with plaster of Paris, pure and simple, letting it remain in the mouth, not until it is partially hard, but perfectly hard, so that it will break when you take it out. Another point. I do not believe we should use any oil on the teeth, or in connection with impressions to cause separation of the cast.

Dr. A. H. PECK: I will speak of one feature of the paper. The author spoke of the efficiency of sulphate of copper in certain diseases, but nothing was said as to how it should be used. I think this quite important. Sulphate of copper is a most useful agent in the treatment of pyorrhœa, and it is also a favorite of mine

in the treatment of abnormal swelling of the gums from whatever cause. The gums are dried as thoroughly as possible and the copper applied by means of a piece of orange wood, whittled thin, which is first dipped in water, and passed into the copper, a quantity of the powder will cling to the stick; then pack the copper down between the teeth and swollen gums. You can use it freely. It is not necessary to exercise care as to the quantity of the powder to be used; let it remain there for two or three minutes, then with a syringe of warm water wash the excess away. You will be surprised in the course of two or three days' time, and also much gratified, to see the extent to which the swollen gums have been reduced.

Dr. IRA B. CRISSMAN: At a recent meeting of the Chicago Dental Society, Dr. Fernandez described a method of using clamps on teeth which I think if universally used would get rid of the uncomfortable sensation around the tooth, and the tipping forward, pressing into the gum at anterior portion. He suggested that the points or sharp edges which ordinarily project and cut into the tooth structure be filed away and a small rubber tube be placed over the clamp, leaving the ends of the rubber tubing a little longer than the clamp to prevent it from tipping, which it so often does, and is very inconvenient and causing great pain. I think the suggestion is a good one, and if used would be beneficial in everyday practice. A great many dentists do not use the clamp on account of the saliva clogging the mouth. This trouble can be obviated by the saliva pump attached to the fountain cuspidor. In conclusion, the clamp should not be used unless absolutely necessary, i. e., where it is difficult to keep the dam away from the tooth, and where the cavity is situated in buccal surface, answers a good purpose to keep gum and rubber away from tooth.

Dr. TEMPLETON (closing the discussion): In reference to the remarks made by Dr. Noyes concerning the use of hand instruments and the engine, I endorse all that he has said. I merely said that most of the dentists, particularly the young men, are using the engine entirely too much. I do not wish to have the impression made that I do not use the engine at all, because I do, and I would not like to be without it. I use a sharp excavator with a handle about six inches long. I learned to use it a good many years ago, and would not like to practice without it. I clean

out my cavities with it. I use the engine in the preparation of a certain kind of cavities. If I want to cut out a fissure of some kind, or to cut tissue, I use the engine for that, with fissure drill or bur.

Dr. Duncan says in making a rubber attachment for artificial teeth to a gold plate, he prefers the use of rubber dissolved in chloroform. I have used this method myself; but prefer the one spoken of in the paper, with a warm spatula or knife to press it down with. It holds better. I want to say, gentlemen, that if you wish to attach rubber to a gold plate without soldering it or punching holes in it you can do it, but the plate must be clean and roughened with clean sandpaper. If you vulcanize it long enough, taking three hours to get up to 320° , and hold it there forty-two minutes and then cool slowly, you will find it will adhere to the gold plate.

Dr. Sitherwood said something about Angle's method of taking impressions. That method is quite different from the one I described in my paper, although it is very good and I have used it many times, but as Dr. Case has very well said, there are cases where that method will not work, and in taking impressions for partial sets it seems to be the most satisfactory method that I have ever tried.

Dr. Case also said something about making solder, that if we used coin or gold we would know what was in them. We would know just how much gold and how much alloy were used. The same way with silver. We know what is in United States coin, and say it is just as good when you know what is in it. The pins I referred to were English pins, made of fine brass and coated with a little bit of tin. American pins are mostly made of iron, and that is why I recommend the English pin.

Dr. Lowry spoke of the use of beads supplanting clamps altogether. That was not the intention of my paper. I use clamps sometimes myself and I use beads a great deal. If you do not have beads you can tie a knot on the ligature, three or four knots in the same place, and it will answer the same purpose. He also says that he has not been successful in taking partial impressions. I have succeeded a great many times in doing this. It does not take very long to trim it out, varnish it, apply more plaster, but if you get an impression this way you have a good one. You get a model which is absolutely perfect and you can make a plate that will fit up to the tooth.

Dr. Lowry spoke of causing pain by using the dental engine. Whenever you use an excavator or chisel always cut from the center, never toward it if you can help it. That is the reason why we hear so much complaint about using the burring engine; dentists cut toward the center instead of away from it.

Dr. Peck alluded to the use of sulphate of copper and he described my method exactly. I use finely pulverized sulphate of copper for this purpose and use it at as he describes it. One word about getting sulphate of copper for this purpose. Do not go to a druggist and have him pulverize it for you. Not once in a thousand times will they pulverize it fine enough. Get the sulphate of copper which is already pulverized for the trade as they have it in a jar on the shelf. It is pulverized into an impalpable powder, and that is what you want. One word about the application of it. Place a napkin or a roll of cotton or bibulous paper inside the teeth, keep it off the tongue, apply it dry, wash it out with hot water; after you have used hot water in removing it from the mouth as much as possible, you can then take absorbent cotton, saturated with pure glycerine, introduce it into the mouth, and tell the patient to keep it there a little while. It will take the taste of sulphate of copper out of the mouth. One thing should not be forgotten. It is not a pleasant thing, that is, many people complain of the taste, but do not complain of the results obtained from it. Use it in one case, get the patient to come back, and notice the result. Its caustic, astringent and stimulant effects will last five days, and it should not be applied oftener than this. It is an astringent to the capillary blood vessels, and its caustic effect destroys the secreting membrane. It is astonishing how rapidly you get results.

I thank the members very much for their attention in listening to my remarks.

DISCUSSION ON DR. A. O. HUNT'S PAPER.

Dr. GEO. E. HUNT, Indianapolis, Ind.: I have been very favorably impressed with Dr. Hunt's paper. It is a valuable scientific and practical contribution to our literature. Science is a systematic arrangement of facts and that is what the doctor has presented here this evening. The three salient points in the paper are first, locating the superior cuspids anatomically instead of relatively to the centrals; second, locating the incisal edge of

the four anterior inferior teeth—a matter of great practical importance; and third, placing the bicuspid well behind the cuspid for scientific and not for empiric reasons.

This paper is an important one and I regret that I did not have an opportunity to read it before this evening in order that I might discuss it in the intelligent manner that it deserves.

Before sitting down I wish to thank the members of the Illinois State Dental Society for the feast of reason and flow of soul, especially the flow of soul, that has prevailed here for the last two or three days. I have thoroughly enjoyed my visit and to me this has been an exceptionally good meeting. I especially admire the fraternal feeling that exists among you; that frank admiration for the earnest efforts of your colleagues that find such open expression on the floor at this meeting.

Dr. C. S. CASE, Chicago: I was very much pleased with the paper. I knew I would be before it was read, for various reasons. One is, I am very well acquainted with Dr. Hunt, and I know that he has given this particular line of work much thought, energy and ability, and I have almost always found that when a man of ability devotes his time to one particular subject or branch of work he develops something more than the ordinary. He has handled this subject in a very able manner and along the lines that have characterized this meeting. He has brought out some ideas that have never occurred to me before, and I do not know whether they are true or not. I did not know before that there was such a universal typical relation between all types of faces as he seems to think. I am quite surprised to learn that the lower incisors have always the same relation to the line of the parting of lips, although I have been aware for some time that the upper incisors vary very much in their relation to the upper lip. The harmony which he seems to think universally exists between certain muscles and features of the face and the teeth, is something that may be true with many people, but it strikes me that there is a greater difference between the harmony of the middle features and the upper teeth than he has expressed. Very many cases of irregularity of the teeth are due to the inheritance of inharmonious types, and I have seen many cases where patients seemed to inherit very large teeth from one parent and very small jaws from the other, and the small jaws seem to be in harmony with the main features of the face while large teeth were entirely out of harmony. But of course

those were cases of irregularity and not of the usual forms. In the construction of artificial dentures it is proper to follow what we may consider the usual forms, and it is a good thing that we have a man who has brought out the relations of the teeth to the external features of the face. As dentists, we have not been thinking of the face at all; we have been looking into the mouth. Our occupation is continually with the teeth and upon teeth, and consequently it has led us to concentrate our thoughts on the teeth alone. We rarely look at the face. In the construction of artificial dentures it is necessary to study the features of the face in order to arrive at anything like perfection.

Dr. HUNT (closing the discussion): I have simply enunciated four principles in my paper, and I trust all of you will feel interested enough to follow up the subject.

In regard to the orbicularis oris muscle and its relation to the movement of the soft tissues, I refer you to paper by Dr. Barrett, read at the American Dental Association last year. It is a very carefully worded description of the orbicularis oris muscle and its relation to the other muscles of expression of the face. I do not want you to get two subjects confused. The paper as presented to you has nothing whatever to do with irregularities. Dr. Case will take care of that subject thoroughly; it has to do, however, with the position of teeth of normal dentures in the mouth, not irregularities. They are all irregular, if we take our ideal of arrangement as a standard. On investigation it appears that there is no such thing as a typical arrangement of teeth. Some of the teeth are out of alignment even in cases that we call normal. That is one of the principal features I dealt with in my paper. The best condition for a study in normal denture is where the teeth are all, or nearly all, in place. A great many in listening to others have their lips apart. The upper lip is not in contact with the lower. When not thinking about it they do not close the lips. These are variations. You will be surprised when you look into this matter to see how many people there are whose lips do not close together when the face is at rest. As you walk along the street you will notice that a large percentage of the people have their lips apart.

In regard to the changes that may occur from abnormal conditions, such as adenoid growths, enlarged tonsils, mouth breathing, etc., these are diseased conditions, and my paper did not

dwell upon them. When we construct an artificial denture we do not want to reproduce the abnormal condition, but a better one if possible. The object of my paper, as I have endeavored to present it, is to study the best conditions of normal dentures in mouths where there is no disease particularly. Fix again in your minds the four principal points, making allowance for the fact that some expose the lower more than the upper teeth, and some the upper more than the lower. Some use the upper lip in speaking, while others use it much less. Wherever you place your upper teeth, keep in mind the relation of the teeth to the lip. There is very little movement to it.

In taking the bite, make landmarks and notes of the characteristics you observe in faces, to be used when you make artificial dentures. In relation to prosthetic dentistry, some one said to-day that he was glad it was receiving more attention. Did you ever think of it, that you can almost count the experts in this department on the fingers of one hand? It is not strange at all that this subject has been neglected, simply because it requires a broader field of thought, broader effort, and indeed a better knowledge of the collateral sciences in order to get established in your mind a basis upon which to build, than in any other operation that we are called upon to do as dentists. It has always been called mechanical dentistry and thought of as such. The results you want to obtain are entirely outside of the field of mechanics, and mechanics do not apply to the results, only in the methods of putting the materials together. The human form is not a machine that is put together like an engine. It is put together in a certain way, with varying modifications. This is true also of the relations of the teeth and lips to each other. These variations are constant. Each case requires special care, special study, effort and observation as to the relation of the muscles in what we call their normal position. It required the dissection of more than twelve hundred cadavers to find out the normal position of the arteries in the human body. These variations are still present and confusing, with all the knowledge we have of anatomy.

[TO BE CONTINUED.]

ST. LOUIS DENTAL SOCIETY.

Dr. FLETCHER: One of the chief barriers often in the way of successful diagnosis is the opinion of the patient. While their judgment is often valuable and should be heard patiently at all times, the operator should always have corroborative evidence before he proceeds to the treatment of the case. Any case of reflex pain shows not only how valueless is the opinion of patient, but also how misleading.

I can think of no place where symptomatology should be more carefully studied than at the dental chair. In reference to induction of medicaments into dentine and pulp by cataphoresis and trouble ensuing, I must differ. In my opinion it will not be the drugs used to bring about anæsthesia that may cause death of pulp, but more likely to be the electrical current used at too high voltage.

Some cataphoretic machines will give as high as 60 volts, which is claimed by some will destroy tissue. Of course, they contend this amount is not to be used to produce anæsthesia on sensitive dentine, but only where a pulp is to be extirpated. But a small percentage of dentists are posted sufficiently on the science of electricity to know what voltage is injurious, and will likely turn on the full force in case anæsthesia is not produced in the time they think it should be, although by their carelessness the current may be deflected from the tooth entirely, and entering the soft tissues, possibly doing more harm than if pulp had been devitalized.

Dr. MARSHALL: Another danger in the use of cataphoresis is that the operator may approach too near the pulp, or even expose it. This does not condemn it, but should make us more careful. We should know the anatomy of a tooth so thoroughly that the pulp would be in no danger from our burs. I think cataphoresis a good thing, and know it will obtund; but am not sure it may not injure the pulp.

Dr. G. A. McMILLEN: In speaking of diagnosis, a difficult case presented itself to me over a year ago, and again recently. A young lady complaining of neuralgia in superior arch, but unable to locate point of disturbance. Anterior teeth seemed to her to give most pain at times.

Teeth perfect, no decay, color normal. Found no cause of

trouble to operate on, so gave constitutional treatment and dismissed her. A year later she presented herself, the trouble having returned in more violent form, but still she was unable to point to tooth or teeth causing it. Color still good, no soreness, but centrals failed to respond to tests as they did a year previous. I determined to open them, which I did cautiously, and found both dead, and pulp dried up. On treating and filling roots, trouble has all disappeared.

Must take issue with Dr. Marshall, as I contend no man can feel that he is not in danger of exposing a pulp at any time. The Doctor also related one of his successful (?) cases of capping a slight exposure made by himself. He placed a small cap of No. 60 gold and platinum dipped in chloro-percha over point of exposure, filled tooth, and for years pointed to the case with pride. After a lapse of seven years the patient presented herself, and lo, the tooth is as blue as the proverbial whetstone. He caps less than in days of yore.

Dr. COX: I recently had a very difficult case to diagnose. All the symptoms of an acute abscess were present except decay in tooth. I was on the point of opening into pulp chamber at a venture when I concluded to examine again. I was rewarded by finding a foreign substance under free margin of gum in proximal space which on removal proved to be part of a wood toothpick. Have had two similar cases and both became normal on removing section of wooden pick.

Dr. WINDHORST: I agree that but little confidence can be placed in the opinions of patients. Think cataphoresis a good thing for the removal of pulps and can fill roots better, there being no sensation.

Dr. CONRAD: Diagnosis is a very good thing but in dentistry the Lord is on the side of the best guesser. I differ from our essayist in regard to pain being a friend; it is a delusion and only imaginary. (Laughter from several members.) I used to laugh at those assertions, too, but have quit it. Christian Science patients being the best I ever worked for. In cataphoresis I am afraid of the current, not of the medicines conveyed by it.

Any man may go too near or even expose a pulp at any time, especially in centrals and laterals where horns often approach very near the surface, and no anatomist can tell whether they are there or not till he exposes them, especially if he is using cataphoresis.

You will have very good results in obtunding dentine by using a hypodermic injection of cocaine at the gingival margin of tooth to be operated on.

Dr. BARTLETT: I believe in pain and that it is our friend. My experience with Christian Scientists has been limited. One came to me to have pulp removed. I excavated quite near pulp and enquired if it hurt. She said she felt no pain. I uncovered the pulp, still no pain. Took broach and punctured pulp but she claimed to feel no pain, although a big tear was standing in each eye. I gave her an appointment but she never came back. The obscure cases that require careful diagnosis seldom come to us, but are rushed off to a physician.

An M. D. referred a patient to me once and all the trouble was the closure of a duct. I sent patient back to him with note giving my diagnosis which he found to be correct, but admitted he never suspected the cause of the trouble. "Why," says he, "you dentists know anatomy, chemistry and materia medica as well as we doctors and ought to be classed as professional men."

Dr. MANHARD: Had a case a year ago which puzzled me for a few days but found it to be a third molar erupting. She came a year later with the other side swollen and I naturally supposed the other third molar was erupting, but about the third day both sides were badly swollen and a fine case of mumps was the result.

Dr. HELLMUTH: In one case I applied arsenic to devitalize pulp. When patient came to have pulp removed I found it very sensitive and as a cataphoric outfit had just been left with me I thought I would use it and remove pulp. I did so but the current carried the arsenic through as well as the cocaine and has caused much trouble. I give this case as a warning to others.

Dr. CHISHOLM, in closing, said that in diagnosis we are often called upon to differentiate between soreness and sensitiveness, which was very important. Also in old people and in abraded teeth the location of pulps was abnormal and uncertain, and often great care must be exercised in locating them.

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EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

AMALGAMS.

The query is, how many teeth, relatively, are saved by the use of amalgams compared with gold? Have we reached the acme of skill in making gold fillings after the known requirements of cavity preparation? Do we get the best results from the use of amalgams that it is possible to attain in all cases? Are there not too many poor gold fillings and too many poor amalgam fillings made even now? Are we utilizing our knowledge and skill with sufficient painstaking care in all cases to say that we are doing the best possible in every case? Are we attempting to change the environments with enough earnestness to ensure the best results? Are as many teeth saved by filling as ought to be saved? We are led to these reflections by what we see and hear; and we desire to encourage and stimulate some of the rank and file to do the best all the time, and then there will be no regrets and few failures.

THE MIDSUMMER MEETINGS.

For some unknown reason nearly all of the State organizations hold their annual meetings during the months of May, June, July and August.

In looking over the papers read at the meetings held in June and July for several years with the appended discussions we find that they do not average as well as those read in April and May or those of September and later in the year. The best papers as a rule are those read before the local societies or special meetings held from October to May inclusive. Such meetings are less of the nature of mass meetings, or outing meetings than those held

during the hot months. Do we not find in this fact an argument for the abandonment of all professional meetings during July and August? Are not the participators in better mental and physical trim to read papers when the thermometer registers 75° F. than when it goes up to 90° or more?

For many years all of the national organizations have held meetings either in July or August and by comparing the scientific and practical value of such meetings with other similar society meetings the verdict is in favor of the latter taken in a series of years. Can we not have here a reform movement so that our national body can meet in May, June or September, or later in the year. A week given to a meeting which will produce the best results will not be time wasted but will place us in a higher rank as a scientific body. Who will start the movement to change the date of holding the meetings of the American and Southern dental associations either earlier or later in the year?

AMERICAN DENTAL ASSOCIATION.—OLD POINT COMFORT, VA.,
AUGUST 3, 4, 5 AND 6, 1897.

REPORT BY LOUIS OTTOFY, D. D. S., CHICAGO.

The thirty-seventh annual meeting of the American Dental Association was called to order at 11 A. M., August 3, by the President, Dr. James Truman, of Philadelphia.

The publication committee and executive committees made their reports.

The treasurer's report showed a balance of \$1,585.34.

The Horace Wells Memorial Committee reported that the amount on hand toward the erection of a suitable memorial to Horace Wells is \$677.22.

Dr. James Truman, the President, then delivered the annual address.

PRESIDENT'S ADDRESS.

Dr. Truman called attention to the progress made during the year in the various divisions of the science of dentistry. He called attention to the unselfish sacrifice made by many in the dental profession for the better advancement of science. He enumerated the various improvements and inventions relating to dentistry from the time of the discovery of artificial teeth in France to the

introduction of cataphoresis, the development of dental science from Leuwenhoek to Magitot, Tomes and Miller, and the progress made in dental education since the establishment of the first dental college in 1839. He called attention to the chaotic and unsatisfactory condition of the dental laws in the various States in the Union, and expressed the hope that a time will soon arrive when the different laws will be made to conform and enable the practitioner from one State to remove to another and practice without hindrance. He expressed the opinion that the laws to govern the practice of dentistry are contrary to the constitution of the United States. The enforcement of the laws is intrusted in most instances to persons or boards entirely unfamiliar with the requirements of an examiner.

He called attention to the fact that in thirty-seven States the appointment of the members of the board is vested solely in the governor, in eight States in the State Dental Association, and in four of them the appointments are made by various other methods.

Dr. Truman paid a marked tribute to the memory of Horace H. Hayden, and regretfully expressed the opinion that the valuable services he rendered to the profession have never been fully appreciated or recognized.

He called attention to the proposed union of the two associations at this meeting and expressed the hope that such a union would be so effected as to bring about a marked improvement in the new organization.

After the presentation of the address the association adjourned to meet in the evening.

The association reconvened at 8:30 P. M.

After the transaction of the usual routine business, Dr. W. A. Price, of Cleveland, Ohio, read a paper on the "Therapeutics and Physiology of Cataphoresis." The essayist recited the various theories held regarding the process by which medicaments are introduced into tooth tissue. Briefly summed up, the most important points determined by the experiments of Dr. Price extending over 1,500 cases, are as follows: About thirteen minutes is the average time required to secure good results, the difference as to the concentration of the solution used is immaterial, the drug cannot be introduced simply by osmosis except in an unimportant quantity. Dr. Price holds that the process is that of electrolysis, the compound being decomposed and recomposed. His experi-

ments seem to prove that insensibility to pain cannot be produced by the hydrochlorate alone, nor by the electric current alone, experiments on lower animals proved that poisonous substances placed in contact with the skin for some time caused no appreciable effect, nor would the current of a certain determined quantity have any deleterious effect, while the two combined resulted in death after a short time.

Dr. M. L. Rhein in discussing the subject called attention to the fact that the use of cataphoresis without a milliamperemeter, is like the administration of medicines without relation to their quantity, hence he urged the importance of always knowing the exact quantity of the current. It is the speaker's opinion that the time necessary to obtain good results will be reduced by some arrangement whereby the entire surface of the cavity will be in contact with a metal through which the current can be communicated to all parts of the cavity.

Dr. Custer agreed with the principal conclusions of the paper, and Dr. Cassidy called attention to the fact that some drugs are carried from the negative to the positive pole and vice versa, and that therefore there is sufficient room for intelligent experiments along this line.

Dr. W. St. George Elliott felt that before accepting the conclusions of the essayist the experiments ought to be gone over by others in order to corroborate them. After this the society adjourned.

WEDNESDAY, AUGUST 4.

The association convened at 11 A. M. Dr. J. S. Cassidy, of Cincinnati, then read an address entitled, "Relation of Chemistry to Dentistry."

The essayist called attention to the history of the progress of dentistry. He claimed that caries is nothing but a chemical progress. It was suggested that in cases where drugs are carried by the electric current from the cathode to the anode the term "anophoresis" is the proper one to apply. The essayist referred to the imperfect and incorrect nomenclature of chemical dentistry and expressed the hope that the subject will, in course of time, meet with improvement.

A general discussion, with no dissensions from the views of the essayist, was participated in by Drs. Barrett, Pierce, W. St. Geo. Elliott, Taft, H. A. Smith, Patterson and others.

Dr. C. S. Case then read a paper entitled "Principles of Force and Anchorage in the Movement of Teeth."

The paper was presented in Dr. Case's usual forcible manner, the principles involved. The subject was discussed by Drs. Jackson, Ottolengui, Guilford and others, and finally closed by Dr. Case.

The sections were then organized and the association adjourned.

The association reconvened at 9 P. M. Dr. I. N. Broomell then read a paper entitled "Developing Tooth Tissue."

This paper was illustrated by a large number of stereopticon views, and presented the subject of the development of the teeth during foetal life in a thorough and admirable manner.

Dr. Broomell gave a great deal of time to the study of this subject and the results fully justified the conclusion that the work had been thoroughly done.

After the reading of this paper the association adjourned.

THURSDAY, AUGUST 5. MORNING SESSION.

The association reconvened at 10 A. M.

The chairman of the committee on necrology, by its chairman, Dr. Taft, reported on the deaths of Drs. Frank Abbott, Francis Peabody, S. B. Brown, Eli Slegel and W. N. Morrison.

The paper of Dr. Broomell read last night was then discussed by Drs. C. N. Peirce, and Dr. J. D. Patterson and the subject was passed.

Dr. Patterson then read the report on Section VI. on physiology and etiology. Dr. Patterson presented a résumé of what has appeared in dental and medical journals relating to the subjects embraced by the title of the section.

Dr. W. C. Barrett then made the report of Section VII. on anatomy, pathology and surgery, covering these subjects and giving a résumé of the work done in these branches.

The most important work of this section was the exhibit of anatomical and pathological specimens as shown in the perfected list.

Dr. T. W. Brophy, of Chicago, then read a report of a case showing the relation of the frontal sinus to the antrum.

Dr. C. N. Peirce, of Philadelphia, then read a paper entitled "Structural Development."

The paper of Prof. Chas. H. Ward, of Rochester, N. Y., which is a voluntary essay entitled, "The Teeth as a Factor in Anthropology" was read by title as also a paper by Dr. Thos. Fillebrown, of Boston, Mass., entitled, "Further Studies of the Relation of the Frontal Sinus to the Antrum."

Section I. was then reverted to and Dr. M. F. Finley, of Washington, D. C., then read a paper entitled "Opening the Bite and Preserving the Pulp with Cap Filling."

These various topics were discussed by Drs. Peirce, Barrett, Taft, Patterson and others.

The association then adjourned.

(TO BE CONTINUED.)

NATIONAL ASSOCIATION OF DENTAL FACULTIES.—OLD POINT COMFORT, VA., JULY 30-31, AND AUGUST 2, 1897.

REPORT BY LOUIS OTTOFY, D. D. S., CHICAGO.

The fourteenth annual meeting was held at the Hygeia Hotel, Old Point Comfort, Va. Of the thirty-nine members thirty-five were represented by delegates.

During the three days' session five colleges were admitted to membership as follows:

Tacoma College of Dental Surgery, Tacoma, Wash.; Ohio Medical University, Dental Department, Columbus, Ohio; Milwaukee Medical College, Dental Department, Milwaukee, Wis.; New York Dental School, New York, N. Y.; Baltimore Medical College, Dental Department, Baltimore, Md.

Applications have been received and accepted from the following schools. These are to be acted upon at the next annual meeting:

Dental Department of the University of Omaha; Dental Department of the College of Physicians and Surgeons of San Francisco, Cal.; Colorado School of Dentistry, Denver, Col.; Pittsburg Dental College, Pittsburg, Pa.

A committee of five was appointed to confer with a similar committee from the National Association Dental Examiners, with a view of harmonizing the differences which may arise between two associations; this committee was ordered to act during the year on all matters of mutual interest and report next year.

The following report was adopted:

Your committee on choosing a color respectfully report that they have decided to recommend the standard lilac as the distinctive dental color, and they recommend the adoption of the academic costume according to the requirements observed by the intercollegiate system.

J. D. PATTERSON,

E. C. KIRK,

H. W. MORGAN.

Committee.

Requests of colleges for permission to confer honorary and *ad eundem* degrees, were declined.

Dr. Barrett read a paper on the "Study of Anatomy," and a committee was appointed to provide similar papers for next year's meeting.

A committee was appointed to make some arrangements whereby the value of the papers of foreigners who desire to attend American dental colleges, may be accurately determined.

A committee on necrology report resolutions of condolence on the death of Drs. Frank Abbott and Francis Peabody.

The following officers were elected for the ensuing year: President, T. W. Brophy, Chicago; Vice President, D. J. McMullen, Kansas City; Secretary, J. H. Kennerly, St. Louis; Treasurer, H. W. Morgan, Nashville; Executive Committee: J. Taft, Cincinnati; Thos. Fillebrown, Boston; B. Holly Smith, Baltimore.

Ad Interim Committee: James Truman, Philadelphia; F. J. S. Gorgas, Baltimore; J. Hall Lewis, Washington.

A vote of thanks was tendered to the retiring president for his able services during the year.

A vote of thanks was tendered to the retiring secretary for his services during the past four years.

The association adjourned to meet at the call of the executive committee.

PRACTICAL NOTES.

On page 581 of the July number of the DENTAL REVIEW, we published a letter from Dr. Griswold of Denver, which, as a result of some errors was not correct, we therefore republish the letter with the necessary corrections.

DENVER, June, 1897.

EDITOR DENTAL REVIEW.

Dear Sir :—I have been using lately for extracting teeth and

for the extirpation of pulps a preparation consisting of 3 per cent solution of pyrozone aqua destillata *aa* q. s. or peroxide hydrogen in place of pyrozone.

It has proved so satisfactory that I brought it up before our State meeting where it received endorsement. I would like you to bring it before the Chicago Dental Society for discussion as to its merits, if you will.

Its action is on the pressure theory, of course, but produces an immediate whitening of tissue and insensibility lasting for several minutes, no sloughing afterward. In cases where abscesses exist, and they are injected, sometimes the immediate and intense pressure causes some pain but not always. It seems to me an idea of possible benefit to the profession, relieving them from the purchase of expensive preparations, and I know of nobody more competent to sift its merits than the Chicago Dental Society. Whether it is an original idea or not I do not know, but have never had it suggested to me in reading or conversation.

If you bring it up and will be kind enough to let me know the report, will be grateful to you.

W. E. GRISWOLD.

EUROPEAN PROGRESS—SUBMARINE GOLD FILLINGS.*

"Long before Barnum discovered the rubber dam, we filled teeth with gold, under water, notwithstanding the fact that this was always considered unsatisfactory as to results." Thus filling with gold in the presence of moisture is old, but it is new that we may use gold for filling teeth admitting moisture, and obtain perfect results. Now if any one desires to inform himself as regards the assertion in the concluding clause of the above quotation, we will refer him to the published transactions of the American Dental Association, American Dental, August 6, 1878, page 210. Query: Is the keeping of cavities dry an absolute necessity in filling of teeth, in order to preserve them? The author in that paper says: "I have kept a record of cases where I was unable to keep the cavity dry to the end of the operation, and I find after a period of ten years, that they bear the test of time as well as others that I filled in the same month, in which I succeeded in excluding the moisture." In connection with the foregoing, I cannot refrain from

*Items of Interest, May No., 1897, page 379.

relating a story told on one of the fathers of dentistry in our country, Dr. H. H. Hayden, "Peace to his ashes!" by Dr. W. H. Morgan, of Nashville, Tenn., who being at the time on the committee on voluntary essays, and to whom the paper had been referred. Dr. Chapin Harris had for a very intimate and dear friend, Dr. Hayden, being colaborers in the same vocation, which they dearly loved and cherished, though living apart often visited each other, to compare notes on the science and art, in which they felt such great interest. It happened on one occasion, that Dr. Harris wanted the opinion of his friend in regard to an operation he had performed for his daughter, so calling her in, he requested Dr. H. to examine a particular filling he had put in one of her teeth. Hayden made a thorough examination of the tooth and filling, could not see anything wrong with either tooth or filling, asked the young lady if the tooth gave her any pain or caused her any inconvenience; to all of which he received a negative reply. Turning to his friend Harris, querying to himself what all this meant, asked for information. Smilingly Harris answered, "that that filling had been put in his daughter's tooth two years previously, and that it was a submarine filling." "But it is new that we may use gold for filling teeth admitting moisture, and obtain perfect results." Yet it is over twenty-nine years old, according to the dates given in this correspondence, and where does the progress or novelty come in at?

Yours truly,

GEO. J. FRIEDRICHS.

MEMORANDA.

Omaha in '98, National Dental Association.

Dr. Fox, of San Francisco, was in Chicago in July.

A new edition of Tomes Dental Surgery is out 1897.

The attendance at Old Point Comfort was about 300.

It was as hot as Hades during the meetings at Old Point.

Dr. Charles W. Jones, of St. Paul, was in Chicago in July.

No more American, no more Southern, call it the National.

Did you ever notice that platinum gold sometimes scales off.

Dr. J. T. Abbott, of Manchester, Iowa, was in Chicago in July.

Dr. E. H. Haas, of St. Paul, Minn., called in to see us in July.

Dr. W. P. Dickinson, of Minneapolis, Minn., was in Chicago in July

Dr. Wm. Mitchell, of London, England, is visiting friends in Chicago.

A new Richardson's Mechanical Dentistry, revised by Warren is out. 1897

Dr. E. Pittwood, of Spokane, Washington, was in Chicago in July and August.

Dr. George S. Nason, of Omaha, visited Chicago on his way to Old Point Comfort.

The Chamberlain is an ideal place for large meetings such as was recently held at Old Point.

Dr. F. P. Webber, of Cherokee, Iowa, passed through Chicago on his way to Twin Mountains, in July.

Dr. W. S. Hosford, of Iowa City, the new dean of the dental department, paid us a visit in Chicago recently.

Another new dental college in Indianapolis. Dr. Junius E. Cravens is at the head of it. It will open early in October.

Why is it not good practice to use a dressing in a tooth after excavating? Many do it without bad results, why not you?

Section on Dental and Oral Surgery American Medical Association, Chairman, G. V. I. Brown, Duluth, Minn., Secretary, E. S. Talbot, Chicago, meets in Denver, January 7, 1898.

Take iodine crystals, place in absolute alcohol until a saturated solution is secured. Then take of the above one-third, tinct. of aconite root one-third and chloroform one third. Mix. Iodine point.

A new dental law in Natal. L. D. S. is the only recognized qualification. Penalty six months or a fine of £100. Americans and other foreigners are too numerous at present and some are leaving.

When you are about ready to quit work for a week or two go to French Lick or West Baden mineral springs in Indiana. The "Monon" route from Chicago, Louisville, Lafayette or Indianapolis will take you there.

KLONDYKE OR YUKON.

If you go be sure and leave about March 1 next, and take enough clothing and money and instruments and materials and food and medicine to last a year

NEBRASKA.

Officers and members board of dental secretaries—William C. McHenry, President; Orion Fremont Lambertson, Secretary; Howard C. Miller, Treasurer

Dr. E. Magitot left a sum of money sufficient to form a biennial prize of 1,000 francs to the person who makes the best contribution to the subject of stomatology (sic) or odontology. Of course the candidate must be a doctor of medicine.

Of some of the early day dentists present at the American Dental Association and Southern meetings, were W. H. H. Thaxton, Corydon Palmer, Drs. Green, of Westchester, Pa.; McKellops, John B. Rich, Taft, H. A. Smith, Cushing and others.

The Virginia State Dental Association met at Old Point Comfort, Va., during the meetings of the American and Southern associations, and in view of the meeting of these bodies, adjourned without electing new officers, after transacting the usual routine business.

FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

The First District Dental Society of Illinois will hold its fifteenth annual meeting at Streator, September 14-15, 1897.

W. O. BUTLER,

Secretary.

L. W. SKIDMORE,

President.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

Truman W. Brophy, President, Chicago; D. J. McMillen, Vice President, Kansas City; J. H. Kennerley, Secretary, St. Louis; H. W. Morgan, Treasurer Nashville. Executive Committee—Jonathan Taft, Chairman, Cincinnati; Thomas Fillebrown, Boston; B. Holly Smith, Baltimore. Ad Interim Committee—James Truman, Chairman, Philadelphia.

FEVER BLISTERS.

R	Camphor.....	gr. v
	Arrowroot (Powd.) }	
	Bismuth subnitrate }	aa gr. xxx
	Cold cream.....	3 iv

—*Monthly Retrospect.*

DENTAL EXAMINERS.

The following officers were elected: President, C. G. Edwards, of Louisville, Ky.; Vice President, Geo. L. Parmele, of Hartford, Conn.; Secretary-Treasurer, Chas. A. Meeker, Newark, N. J.

The college committee for the ensuing year is composed of G. Carleton Brown, Elizabeth, N. J., J. A. Hall, of Collinsville, Ala., and M. H. Chappell, Knightstown, Ind.

Adjourned to meet in August, 1898.

POWDER FOR CORYZA.

R	Subnitrate of bismuth.....	1 drachm
	Powdered camphor.....	6 grains
	Finely powdered boric acid.....	3 grains
	Hydrochlorate of morphine.....	½ grain
	Hydrochlorate of cocaine.....	¼ grain
	Powdered benzoin.....	15 grains

This to be snuffed up the nose.

MINNESOTA STATE DENTAL ASSOCIATION.

The fourteenth annual meeting of the Minnesota State Dental Association will be held in Minneapolis, September 8, 9 and 10. The meeting will be held in the dental department building of the State University. An interesting program is being prepared, and a good meeting is assured. A cordial invitation is extended to all dentists outside of the State, and those in the State are urged to come and join us. Reduced rates will be given, as the State Fair will be held during that week.

H. L. CRUTTENDEN, *Secretary.*

DYSPEPSIA.

The following prescription is often made use of by M. Linossier

R Sodium bicarbonate.....	gr. 300
Calcined magnesia.....	gr. 75
Bismuth subnit.....	gr. 30

M.

This quantity may be divided into twelve or twenty-five capsules, according to the intensity of the acidity and the proportion of magnesia and that of bismuth subnitrate may be varied in accordance with the intestinal functions.—*New York Medical Journal*.

SOUTHERN DENTAL ASSOCIATION, BRANCH OF THE NATIONAL DENTAL ASSOCIATION

OFFICERS.—Dr. E. P. Beadles, President, Danville, Va.; Dr. W. E. Walker, First Vice President, Pass Christian, Miss.; Dr. T. P. Hinman, Second Vice President, Atlanta, Ga.; Dr. F. P. Welch, Third Vice President, Pensacola, Fla.; Dr. B. D. Brabson, Treasurer, Knoxville, Tenn.; Dr. C. L. Alexander, Corresponding Secretary, Charlotte, N. C.; Dr. S. W. Foster, Recording Secretary, Atlanta, Ga.

EXECUTIVE COMMITTEE.—Dr. V. E. Turner, Raleigh, N. C.; Dr. S. B. Cook, Chattanooga, Tenn.; Dr. W. T. Arrington, Memphis Tenn.; Dr. R. K. Luckie, Holly Springs, Miss.; Dr. W. R. Clifton, Waco, Texas; Dr. H. E. Beach, Clarksville, Tenn.

The next meeting will be held at St. Augustine, Fla.

THE NATIONAL DENTAL ASSOCIATION.

OFFICERS.—Dr. Thos. Fillebrown, President, Boston, Mass.; Dr. James McManus, Vice President from the East, Hartford, Conn.; Dr. L. L. Dunbar, Vice President from the West, San Francisco, Cal.; Dr. B. Holly Smith, Vice President from the South, Baltimore, Md.; Dr. Geo. H. Cushing, Secretary, Chicago, Ill.; Dr. W. E. Walker, Assistant Recording Secretary, Pass Christian, Miss.; Dr. Emma Eames Chase, Corresponding Secretary, St. Louis, Mo.; Dr. Henry N. Morgan, Treasurer, Nashville, Tenn.

EXECUTIVE COMMITTEE.—Dr. L. G. Noel, Nashville, Tenn.; Dr. V. H. Jackson, New York City; Dr. J. N. Crouse, Chicago; Dr. M. F. Finley, Washington, D. C.; Dr. J. D. Patterson, Kansas City, Mo.; Dr. H. A. Smith, Cincinnati, Ohio; Dr. Geo. Eubank, Birmingham, Ala.; Dr. W. P. Dickinson, Minneapolis, Minn.; Dr. C. N. Peirce, Philadelphia, Pa.

The next meeting is to be held at Omaha, Neb.

EDITOR DENTAL REVIEW.

Dear Sir:—I propose taking measurements of silhouette sections of extracted teeth for the purpose of compiling a tabulated record showing the exact location of the pulp in each denomination from the time of eruption to old age. In order that this record may be of the greatest possible value to the dental profession it will be necessary to take measurements of a very large collection of teeth, with the age, etc., of each.

It appears to me that the best way to secure so large a collection will be to publish a request in several prominent dental journals, asking the readers to lend a helping hand.

I would specially request each contributor to give the exact age, also sex, nationality and temperament of the patient with each lot.

Yours truly,

R. J. WENKER.

NEW DENTAL COLLEGE—DENTAL DEPARTMENT. THE KEOKUK MEDICAL COLLEGE
ESTABLISHES AN IMPORTANT BRANCH.

Quite an addition is to be made to the educational institutions of Keokuk, for which she is already famous. A dental school is to be founded by the Keokuk Medical College. This institution has leased the second and third floors of Adam Hagny's building on Fifth and Main Street and will fit them up with every convenience for proper and thorough instruction in the principles and practice of dentistry.

The corps of instructors will include Drs. Hinkley, Snodgrass and Stark, besides a number of prominent dentists from abroad. The personnel of the faculty has not yet been decided upon, but this new institution will be ready to accommodate students by next fall. The school will undoubtedly be a great benefit to the city, bringing here a large number of young people who must leave some money in the city.

THE FOLLOWING ARE THE RULES OF THE MEDICAL EXAMINING BOARD OF VIRGINIA.

Members of the Medical Examining Board will meet in Richmond, Va., at 8 P. M., Monday June 21, 1897, for routine work

Examination of applicants for license to practice in Virginia will begin promptly at 9 A. M., Tuesday, June 22 and will continue three days. Every hour from 9 A. M. to 7 P. M. of each day will be occupied in examinations (except the dinner hour from 3 to 4 P. M.)

Applicants must be present from the beginning of the first examination. The first examination, (beginning punctually at 9 A. M., Tuesday, June 22, 1897) will be on hygiene and medical jurisprudence. The question will be put at 9 A. M. and taken down at 12 M., when the questions for the next section will be immediately put up, and taken down at 3 P. M. Then (from 3 to 4 P. M.) comes the dinner hour. Promptly at 4 P. M. the examination questions for the next sections will be put up and taken down at 7 P. M., after which there are no other examinations that day.

Questions once taken down are not put up again.

Applicants for examination should come with the examination fee of five dollars (required by law), which is payable invariably in advance, and report to the secretary and treasurer (Dr. R. S. Martin, Stuart, Va.), who will be in the hall one hour before the appointed time for the first examinations to begin on Tuesday morning to issue in due form permits for examination.

Candidates, in turning in their papers to the examiner in charge, must sign them, not with their names, but with the numbers assigned them by the secretary, which numbers are to be known only to the parties and to the secretary, and by which numbers only are the papers to be examined and marked by the examiners.

Each candidate will have a desk or table assigned him by number, and he is expected to occupy only that desk during the examination.

Candidates are not allowed to leave hall after once entering it, until they have handed in their papers relating to the subject then on the blackboard. Furthermore, they are not allowed, during the progress of the examination, to communicate with each other verbally, or by notes or signs.

Visitors will not be allowed in the hall during the examinations, except by official invitation of the board, and under no circumstances will they be permitted to communicate with or interrupt the candidates during the time of examination.

Each candidate is expected to sign a pledge containing a statement to the effect that he has neither received nor given information on any of the subjects under examination during the time of the examination.

Dental boards would do well to imitate the above.—[EDITOR.]

THE DENTAL REVIEW.

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CHICAGO, SEPTEMBER 15, 1897.

No. 9

ORIGINAL COMMUNICATIONS.

OXYCHLORIDE OF ZINC.*

H. T. KING, D. D. S., FREMONT, NEB.

I have nothing new to present to you to-day, but wish to call your attention to something that was formerly much used in dentistry, but that the older men in the profession seem to have gradually ceased to use, and that I fear the younger men have never learned the value of.

At our interstate meeting last year I took pains to inquire of men I came in contact with if they used oxychloride of zinc. Some who had formerly used it said they did not now, and many of the younger men did not seem to know what it was. I do not mean they did not know chemistry enough to know there was a chloride and an oxide of zinc, but if they ever had learned they had forgotten that the two combined had any place in the practice of dentistry.

Previous to the introduction of the zinc phosphates, oxychloride, under that name or as osteo-plastic, or os-artificiel, was much used for root filling, pulp capping and temporary fillings in live and dead teeth. Our modern plastics withstand the wear of mastication much better than oxychloride and I can readily see why that material was so quickly displaced as a temporary filling, but I am old-fashioned enough to still think it sometimes indicated in root canals.

Of course I understand that the discussion of root filling is a back number and that cataphoresis now has the floor. You will pardon me, however, if I take one more shot.

*Read before the Nebraska State Dental Society.

Is it not a little strange that a subject should have been so prolific in bringing out papers and causing so much discussion, when the whole matter was so easily disposed of?

You know the old mummifying idea has been revived and emphasized: Recently devitalized teeth are to have the bulbous portion of pulp removed, a mummifying paste placed over the opening to canal and "the pulp in root canal can be made to serve as their own root canal fillings." Simple isn't it? That disposes of all recently devitalized teeth.

There still remained, however, those teeth we are constantly dealing with where the pulp has been long dead and is disorganized.

For these we have had promulgated within the year a new method by which "a root canal, whatever its length, whether straight or tortuous, whether filled with semi-devitalized matter or putrescent pulp and fetid gases, can be disinfected and filled within a period of five minutes." This you know is the new "chemico-metallic method." The method is announced as scientific, and consequently is a little deep for me. If I get the idea it is that the microorganisms are to be electrocuted by the "sensitized alloy" and slightly "modified acid," and their remains allowed to make part of the root filling.

I shall quote freely in this paper, and will make the first quotation for the benefit of mummifiers and new theory men from 2d Peter, 2., 1. "But there were false prophets also among the people, even as there shall be false teachers among you, who privily shall bring in damnable heresies, * * * and bring upon themselves swift destruction."

I said the idea of mummifying pulps had been revived. Your memory may not go back so far, but if you will read the literature of twenty and twenty-five years ago, you will see that it was quite common to have the pulp in a tooth mummify. The difference being that at that time they did not want mummified pulps and were careful to use some method to avoid bringing about that condition.

Listen to some quotations from papers and discussions of twenty years ago:

"The failures in preserving the vitality of exposed tooth pulps by oxychloride of zinc, as formerly applied, have revealed the fact that chloride of zinc in strong solution dries the pulp tis-

sue and mummifies it. Admitting this a fact, chloride of zinc would seem to specially recommend itself as an application to root canals in which a portion of pulp tissue remains."—DR. REHWINKEL.

"I am not an advocate of capping, but when the pulp has given no trouble and is very little exposed I use an oxychloride cement. If the pulp dies under it, the cement has often the power of mummifying it."—DR. CRYER.

"Oxychloride of zinc is well adapted for the purpose of covering pulps. Such fillings appear to impart antiseptic or embalming properties to a devitalized pulp to such a degree as to have obtained for this article an unwarrantable reputation for preserving it alive."—DR. S. B. PALMER.

"Chloride of zinc has repeatedly been introduced into canals to save the pulp, and has converted them into a hyaline body that has been a perfect filling, without any change in the color of the teeth."—DR. W. H. ATKINSON.

You will find in reading the history that the mummification of pulps was a condition frequently found, but no one at the time thought it a desirable one. If

"Cæsar dead and turned to clay
Stopped a hole to keep the wind away,"

his imperial majesty could do no more harm.

On the other hand Ptolemus II. embalmed in the highest style of the art would have been a breeder of pathogenic micro-organism within fifty years if he had not been packed away and kept dry. Did you ever think of the fact that mummies are only found in a very dry climate? and do you think that a root canal will remain dry if the contents is only a dried and shriveled up pulp? I do not, and cannot believe it to be good practice to intentionally leave dead pulp tissue in a tooth.

I say intentionally, for I admit that with the most careful manipulation we may not succeed in removing every particle.

Admitting that there may be a small amount of tissue that needs mummifying, I hold that there is nothing better for the purpose than chloride of zinc, and that, combined with the oxide, it makes as good a filling as can be used in root canals. Do not take my word for this but note some thing men who have been thinkers, teachers and successful practitioners, have said on the subject.

"I always fill the pulp cavity with osteo-plastic. That is the

thing, as I understand it, and there is nothing better. It acts as a disinfectant, and is an excellent filling for the root."—DR. CLOWES.

"A thin almost fluid mixture of the oxychloride of zinc filling is best adapted for this purpose. Although not as fluid as a gutta-percha solution, it has this great advantage, that it will exert its drying and preserving or mummifying effect upon the tissue remaining, incorporating itself therewith, and preventing any future putrefactive action."—DR. REHWINKEL.

"For permanently filling the pulp cavity carry a small pellet of cotton to the extremity of the root, pack solid, and complete with oxychloride of zinc. The oxychloride so long as it retains its chlorine, will remain as a constantly present preventive against future development of spore."—DR. ROGERS.

"Its application to root filling has been very satisfactory with many of the best men in the profession. It can be carried to the extreme ends of the roots of teeth. Its antiseptic properties lessen the likelihood of periosteal difficulties, and there is not that incompatibility existing between devitalized teeth filled with this in the root that there seems to be when metal is used."—DR. HOWARD.

"I am in the habit of filling (roots) always with oxychloride of zinc, because of the antiseptic character of the chloride. It prevents further decomposition as far as anything I know of."—DR. ALLPORT.

Speaking of immediate root filling Dr. Ottolengui has said: "I think that a coagulant is here indicated, and that the one better than all others is chloride of zinc. The pulp being removed, and the medicament applied, what results? The escharotic property is exerted at the point immediately in contact, and the animal matter is destroyed. But this action is circumscribed. Somewhat deeper a coagulum is found. But there is another property which this agent possesses, and that is the mummification of animal tissue. This, I conceive, is what occurs in the minutest portion of the tubuli."

Some one will ask, what will happen if this material passes through the foramen? It will hurt, just as any escharotic brought into contact with soft tissue will cause momentary pain. This, however, ought to be of short duration. I do not think it well to allow any root filling to pass much beyond the end, but know of no reason for expecting more trouble from a little oxychloride of zinc than any other filling material. One more quotation: "Chlo-

ride of zinc locally applied is recognized as among the most efficient agents known for promoting healthy granulations, as in addition to its escharotic properties it appears to exercise a greater influence over the vital action of neighboring parts than most other caustics; the separation of its eschar leaving healthy and vigorous granulation. It is equally efficient as an antiseptic and disinfectant. The antiseptic and stimulating action of the chloride of zinc is of a most beneficial character, inducing in many cases better organization of the tissues in the living parts to which it is applied."—
DR. D. D. SMITH.

Oxychloride of zinc as met with in the dental depots consists of a watery solution of chloride of zinc in one bottle and the powder in another. The powder having been prepared for use as filling material, has mixed with the oxide of zinc such materials as powdered slate, flint, feldspar, silex and borax, this to improve the color and give hardness. Particles may be found too coarse to enter a fine canal. For that reason I prefer the oxide alone; mixed with the fluid it gives a dead white and is superior to paper or anything else for lining frail teeth to improve their color.

The oxide of zinc can be found at any drug store, and the fluid may be prepared by placing *zinci chloridi* ʒi in a flat porcelain or glass dish and allowing it to stand a few days in a damp place. It will take from the atmosphere water enough to deliquesce, or you can make your liquid by fully saturating muriatic acid with metallic zincs, allowing it to stand a day or two uncorked. Either solution should be filtered before being-bottled for use.

Its strong affinity for water is one of the best points in favor of this material for root canal fillings. You all know that in the use of gutta-percha the prime requisite is absolute dryness. This I conceive is very difficult to obtain in many canals we find. I feel certain that hot air will not dry them and have never seen a root dryer that was fine enough to go where we are able to put some of the fine bristles we use.

If you attempt to work chloro-percha into a canal that is not dry the material will not leave your dry broach to adhere to the walls but will come back. Not so with my material, its affinity for water is greater than the mechanical hold on the broach and it will stay. The only effect moisture in the canal can have is to make the mixture a little thinner.

I understand the claim for gutta-percha as a superior root filling, to be that it is more easily worked and more certain in the results. Neither of these claims in my hands have been proven to be true, for after filling the canals in dozens of freshly extracted teeth with chloro-percha, I have found myself unable to make any more perfect fillings than with the oxychloride. The fact that a number of members of this Society, as well as picked men in adjoining States, failed to do any better with teeth I sent them, leads me to think that this was not entirely owing to my awkwardness.

I must therefore decline to abandon a material that has so many good therapeutical points for one that is mechanical only in its results.

FILLING ROOT CANALS WITH WOODEN POINTS.*

BY GEO. A. McMILLEN, D. D. S., ALTON, ILL.

Although but just returned from a vacation in Europe, I am informed it is my turn to present a paper to this society and although not well prepared, for the notice has been too short, to write an elaborate paper, I will give you as best I can my thoughts and practice on expulsion of pulp and filling of root canals. When a tooth is presented to me for treatment, I am to decide whether or no it is to be devitalized. If it has ached only a very little, or if as sometimes occurs a pulp is wounded accidentally by the bur I would perhaps cap it by dipping a piece of platinized gold, such as I use for filling (No. 60) into thin chloropercha laying this over the exposure, and evaporating the chloropercha with warm air. I have used this practice with good result, for the patients still come to my office after several years. However, I believe nerve capping should be indulged in to a very limited extent, and I do not do so much of it as I did in the earlier years of my practice, so we will devitalize the pulp. I use as I suppose every one does arsenical paste, first, however, if there be much inflammation in the pulp use palliative treatment for two or three days, that is, I place campho-phenique, oil cloves or carbolic acid, in direct contact with the pulp and cover with cotton or cement, for if inflammation is reduced before arsenic is applied much less pain is experienced in the devitalization. Now apply the arsenic a very small bit, over this place a piece of cotton moistened in car-

*Read before the St. Louis Dental Society.

bolic acid. I do not want too much acid because in the subsequent treatment when you cover all this with cement as I always do, one may press the liquid out and with it minute particles of arsenic. I seldom use a rubber dam for such work; however, I do not object to any one doing so who may desire, for it is no doubt a good plan, but I do not need it. I leave arsenic in a tooth often a week, indeed, I think it very good practice to do so and if necessary longer time; however, forty eight hours or even less may do, but a longer time is much better. Upon the return of the patient, I open the tooth and if by any means I can get the pulp chamber open freely I proceed to expel the pulp and here let me say and emphasize, many dentists punish a patient without cause; there is only one way a pulp may be expelled if sensitive without pain and that is by inserting the tip of a small piece of wood properly trimmed into this chamber (the small round Japanese toothpick I find best for this purpose), trim even smaller so it may go well toward the apex when driven in and striking it a sharp blow with a mallet; be sure the blow is direct and quick, as upon this will depend the success of the operation. I venture the assertion that by this means, done in a proper manner, a pulp can be extracted with the minimum amount of pain, often as the stick goes in the pulp will come entirely out, at other times it will be found adhering to the stick upon its removal, and again will not come away but upon withdrawing the stick and inserting a broach the pulp will be found lying in the chamber broken off at the apex, and easily removed.

Some years ago I gave a clinic before the St. Louis Dental Society, having a patient at the time who was a fit subject. I took him with me, having placed arsenic in the tooth the day before. I opened the pulp canal very carefully, and with some pain to the patient I inserted the point of my wedge, having previously dipped it in oil of cassia, and struck it a sharp blow, in the presence of as many gentlemen as could crowd around the chair. The pulp came away entire. Canal was washed out, and filled at once in the usual way. My patient did not flinch, and when asked, said he felt no pain. Some of the gentlemen present said I had him trained not to flinch, but it is pretty hard to get one not to flinch when he is hurt. Now, I do not think any one could have taken that pulp out with a broach without much pain. That is only a sample of what occurs in my office almost daily. Why such ex-

pulsion does not give pain, I will leave to you for solution. I think it because the act is so quick that there is not time for the motor nerves to convey the sensation to the brain; but whatever it may be, the fact remains, it is ninety times out of a hundred painless, but must be done boldly and quickly, always disinfecting the piece of bamboo "pick," so if it does break off in the root it need not be removed, but left as a good root filler. By this method you do not only a painless operation, but a thorough one; for the pulp will come out whole, and not in shreds, as it often does with a broach. In the filling of the root I follow up this same thought by dipping the same point I have used to expel the pulp, or another one very like it, into chloro-percha, and using it as a piston to force the chloro-percha into the root canal. I like the stick or wood root filler for two reasons; one is, I know absolutely when I am to the apex of the root, because I can feel it; the stick being covered with chloro-percha is left in the root, filling it positively and most perfectly. The other reason is, if after filling the root the tooth, as is sometimes the case, becomes sore or aches from septic matter beyond the apex, clasp the end of the stick left in the body of the tooth with pliers and remove it entire, thereby relieving patient. Treat tooth, and refill when ready. It is a positive way, and a filling that can be removed if necessary very easily, which cannot be said of any other method. Chloro-percha is not positive; wire is uncertain, and often goes beyond the apex. This practice is no experiment, but has been in almost daily use in my office for years. Dr. A. D. Penny is I think the first one to do this. If the pulp chamber be large, wrap the wood point with a small bit of cotton, dip it into chloro-percha and use as a piston to force the chloro-percha up the canal, leaving cotton and wood point in the root. When this is gently and finally placed in the canal, clasp the wood point with the pliers and break it off. Be sure to leave it long enough in the body of the tooth to catch hold of in case you do want to remove it. After leaving this in a tooth for a few days, patient returns to have tooth finally filled, cut off, or if you desire, bur out as much of the wood point as desirable. I do not claim any special originality in this method, fact is, there is very little originality about, anyway. To be entirely original one would have to be born and reared in absolute solitude, never allowed to see or exchange opinions with any one; for as long as man is in contact with man, who have

thoughts similar to his own, or surrounded by books embodying the history and conception of the human race, it is impossible that his thoughts should not be affected by them, that his writings should not be colored by the ideas of others.

I thank you for your attention.

THE CARE OF THE DECIDUOUS TEETH.*

BY MARY E. HARTZELL, D. M. D., MINNEAPOLIS, MINN.

The deciduous teeth are a much neglected and long suffering class of organs, and while I realize that a thoroughly cared for condition in the majority of cases is most difficult to attain we would arrive at a happier conclusion if the profession would unite in a concerted and unceasing effort toward a better condition of affairs in this line.

The first and greatest difficulty is, of course, to get the patients at the right time, and the most practical way to gain this point is probably through two channels, the family physician and the parents. Unfortunately many physicians are most careless of these very important organs, finding in their transient mission the excuse for total neglect; they fully realize that if an animal is imperfectly nourished during the first years of its life it is hopelessly stunted, and while they know the same is true of a child, they so often forget to connect cause and effect in these particular cases; the growth and development of the child depend largely on the condition in which food is ingested as well as its character, and we all know that perfect or even approximately good mastication by broken down, sore and aching teeth; imperfectly masticated food daily ingested produces a weakened if not totally wrecked digestion and this in turn produces a condition of starvation of all the tissues of the body, practically a stunted human being.

I have in mind now a little girl who came into the office, less than a year ago, small for her age, peaked and anæmic; an examination of her teeth showed the first permanent molars erupted but decayed almost to the gum and one missing. The remaining ones were banded and the bands filled with cement and the temporary molars made comfortable and filled. This week she came into the

*Read before the Minneapolis Dental Society.

office again; she had grown so I scarcely knew her and was rosy and healthy looking. On inquiry I found that her father and mother had both noticed her increased appetite and improved general health and had attributed it to the improved condition of her teeth.

Truly, there are the second molars that will make their appearance at the appointed time, but unless the conditions are favorable they will not be of good substance and will consequently not be so durable and the child will have been practically starved during the most important growing period.

We all of us have medical friends and it is possible for us to personally superintend the elimination of this neglect in their most excellent educations. In many of them I think we can arouse an interest sufficient to advise a visit to the dentist when baby is two and one-half or three years old and from that on it is ours to use the influence we possess to see that the visits are regular.

It has been said that "to secure the ideal of perfection the time to commence the care of children's teeth is three generations before they are born." Very good logic but difficult practically. There are opportunities, however, that come to us all and should be invariably used; if the mothers of the commonwealth understood the importance of the use of bone building foods during pregnancy and for the children during their years of growth I believe our cares would be fewer.

Most parents wish to protect their children from the pangs of toothache, but are ignorant as to the proper method of doing it, usually never giving the teeth of their offspring a thought until the evil is so far advanced as to give painful local symptoms, when the children are brought to us in fear and trembling and we will be required to exercise all of our tact, skill and patience to avoid giving those dreadful first impressions that are lifelong and do much to keep patients from our offices.

On the other hand if we get the little patients when we should and their visits are regularly repeated every four or six months the temporary teeth can be kept their allotted time without pain or inconvenience and other things being equal their owners will also possess strong, well-nourished bodies. The space will have been retained for the permanent teeth and we will each have gained many firm and enthusiastic friends.

But unfortunately for us and them the little patients with the

aching teeth are in the majority of those we see for the first time, and for such we must do the best that can be done. If the offending member must be lost I should not hesitate to give the child an anæsthetic and take it out at once, and under no other conditions should an aching or abscessed tooth be extracted for a child in my office.

If there is a chance to alleviate the pain and save the tooth I should win the child's confidence and apply some simple medication, make an appointment and let him go. Never trying to do much more than get acquainted and make a pretense of doing something the first time; if the child is timid this is a good beginning and we should not forget that though some children will bear a first operation of some severity with Spartan-like heroism, no earthly power will bring them back for a second sitting. Children should never be hurt, alarmed or fatigued at the first sitting; of course it would be better if these sensations could be spared them for all time, but if you work up to it gradually you can perform quite painful operations and still retain their good will.

I think it a mistake to ever try to do the most thorough work for little children, better repeat a mild operation at intervals and keep their confidence.

Dr. Bonwill advocated a practice that I think can frequently be resorted to with advantage; he simply smoothed the margins, removed the loose decay, and filled with pink gutta-percha. This is especially adaptable when two proximal cavities come together, the cavities can be filled as one without making any undercuts, and he claims that the elastic quality of the gutta-percha under the force of mastication served to spread the teeth apart and so make space for the larger permanent teeth. I also find this method recommended in connection with the use of nitrate of silver; in this case you approximately adapt your wedge of gutta-percha; dip that part of it that will come in contact with the deeper part of the cavity into powdered nitrate of silver and apply. My authority says that when the filling is worn out you will find the floor and walls of the cavity consist of black hardened dentine that will resist decay for a long time; the silver nitrate also has the quality of obtunding sensitive dentine, and where undercuts are necessary they can be made after this treatment with comparative ease.

I use oxyphosphate and amalgam in many of these cases,

but find if the cavities are large, the gutta-percha is borne with much greater comfort and much less danger to the life of the pulp.

I think it best where there is pulpitis to reduce the inflammation and if necessary destroy the pulp rather than sacrifice the tooth unless it be but a comparatively short time until the tooth will be lost; of course one should never forget the large size of the apical foramen when it is necessary to use a devitalizing agent.

Usually I do not attempt to fill the roots of devitalized temporary teeth, simply pack the pulp chamber with some antiseptic dressing and fill the cavity as usual; in cases where there have been abscesses I have left the chamber free, filled the cavity and then with a drill made a small opening into the pulp chamber through the buccal surface near or above the gingival line and have obtained a comfortable result for my patients, poor practice perhaps, but with little people I find that the "do the best you can" method the only one that is practical.

Two groups of teeth that should receive especial attention are the temporary second molars and cuspids. These teeth remain in the mouth until after the approximate permanent teeth are in position and if they are decaying may cause much damage to them. Another point that should never be neglected is the suggestion to the care takers in regard to cleanliness. The brush should be systematically used as soon as all of the temporary teeth are in position and it should be impressed on the children themselves as soon as they are old enough that its daily use will save them pain, trouble and expense.

We all realize I think that this is a practice trying to patience, skill and strength, and that the results are apparently transient and without honor. But I believe the memory of it will survive and that in after years men and women will be grateful to us for work conscientiously performed.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

BY A. W. HARLAN, M^D. D. D. S., CHAIRMAN, CHICAGO, ILL.*

Following the custom of former reports presented from year to year on the advances made during the time since the last annual meeting, your committee begs to submit the following: The most

*Read before the Illinois State Dental Society, May, 1897.

noticeable work in science is that contributed by Dr. J. L. Williams, of London, England, on the incipency of caries of the enamel. The report of this most industrious worker with the microscope has been published in the *Dental Cosmos* and is still running as a serial in that magazine. From what has already appeared and that which is to follow constitutes the results of years of hard, continuous labor. It is the most admirable undertaking that has appeared in the decade since Miller's studies on the etiology of caries. Dr. Black's recent paper on "Recent Improvements in Filling Teeth," *DENTAL REVIEW* for February, 1897, is commended to your attention as well worthy of study and of being put to practical use at once by all. Hugenschmidt, of Paris, has presented a notable paper on the protection of the oral cavity against the inroads of pathogenic bacteria, *Dental Cosmos*, 1896. Bethel presented a paper before the American Dental Association on "Lining Root Canals with Nitrate of Silver," which is something entirely new. Wilhelm Loche has contributed a paper on the "Earliest Development of the Molars in Man,"* which is well worth careful reading. Walker, of Pass Christian, Miss., read a paper on the Glenoid Fossa, which has attracted much attention.

A recent paper on the discoloration of teeth with copper amalgam, by K. W. Goadby, shows much careful research (*British Journal of Dental Science*). The X-ray has received more attention than was at first thought possible. Catching, Rollins and Kells seem to have been most active of the dental surgeons who have published accounts of their work. Cataphoresis has received much care and attention during the year, more in the nature of its application and the perfection of instruments for the successful use of this method of preventing pain for the extraction of teeth and the obtunding of sensibility of dentine. In this connection it may be well to utter a word of caution, as it appears that pulps may be destroyed by its use and other soft tissues injured by its careless handling. We still believe that it has come to stay as an aid in the preparation of cavities in teeth. Several contributions have appeared on dental anatomical subjects, notably by Barrett and Fillebrown throwing new light on old subjects. Writers have been searching available crania for abnormalities with, so far, few results as the variations were not any greater in former times than at present found by workers in this field.

*See Catching's Compendium.

LITERATURE.

During the year several new journals have been started in the interests of alumni associations, of colleges, and two or three as organs of societies; other than these we have not found any strictly general dental journals that appeal to the whole profession for support. All such efforts are in the interests of the dissemination of sound practical matter, which will have a tendency to elevate the mass of the profession. The new books and new editions of books are not so numerous as in some former years. The most notable in the line of surgery is that of Roswell Park, assisted by a long list of collaborators, entitled, *An American Text-book of Surgery*.

A new edition of Mitchell's *Dental Chemistry* is well worthy of careful perusal. Evans' *Crown and Bridge Work*, is the best of its kind in any language. The *American Text-book of Prosthetic Dentistry*, by C. J. Essig, assisted by a number of our best writers, is said to be unusually well adapted for the use of teachers and practitioners; in fact a teacher said to me that he considered it superior to all others in that line. Hodgen's *Dental Metallurgy* we can recommend as filling a place which had not previously been filled. Burchard's *Dental Pathology and Therapeutics*, is a concise work, more valuable for students than teachers. Turnbull's *Anæsthesia* is one of our best manuals and it is brought down to date. Barrett's *dental surgery for students of medicine* is a new edition. There is not much that is new in bacteriology, anatomy or physiology. Kirke's handbook being however the best in that line.

Catching's *Compendium for 1896*, keeps up its reputation for variety and choice selection of the best matter appearing during the year. Every one ought to have a copy even if he is a subscriber to a dental journal, to encourage the editor.

Magyar Fogászati Szemle (Hungarian Dental Review). Monthly, published at Budapest, Hungary; commenced July, 1896.

La Union Dental (The Dental Union). Spanish, monthly, published at Valencia, Venezuela, commenced November, 1895.

Correo Internacional Odontológica y Clínica Dental. Spanish. Published monthly at Madrid, Spain, commenced July, 1895.

The conclusion which has been reached by this committee is that new life and vigor has been infused into our current magazine literature through the continued influences of dental legislation

and the organization of the faculties of colleges. Had it not been for the aggressiveness of these two forces we would not have witnessed the recent rapid growth of the widespread activities that we are enjoying to-day. The inevitable conclusion is that we are now in a prime way to begin a substantial growth, make history that will be enduring and be a part of the aggregated forces that move the world.

REPORT OF THE SUPERVISOR OF CLINICS.

BY DR. T. W. PRITCHETT, WHITEHALL, ILL

BY DR. E. K. BLAIR, WAVERLY.

Clinic No. 1. Patient, Mr. Vadder. Gold filling in occlusal cavity of left lower cuspid. The incisal edge of tooth was restored. Rowan's pellets being used for body of filling, the operation being finished with William's No. 6. The work was thorough from start to finish.

BY DR. THOMAS L. GILMER, CHICAGO.

No. 2. Patient, Dr. J. F. Wallace, Canton Mo. Gold filling in mesio-occlusal cavity of upper right second bicuspid. Preparation of the cavity was excellent, with the exception of the linguo-gingival angle, which, in the judgment of your committee should have been extended or squared a little more than it was. Dr. Black's margin trimmers were used in the preparation of the margins. Rowan's pellets were used throughout the filling. Probably a better or harder surface would have been obtained by finishing with heavy gold. Contour of filling was good.

BY DR. C. C. CORBETT, EDWARDSVILLE.

No. 3. Patient, Dr. A. L. Nicholson, of Elreno, Oklahoma. Gold filling in distal cavity of upper right central incisor. Sensitiveness of dentine was obtunded with cataphoresis—results being fairly satisfactory. In our judgment the linguo-cervical angle should have been extended a little farther.

Oxyphosphate cement was used to anchor the gold, thus preventing the extravagant cutting of tooth substance—starting one-third of cavity first and finishing with a large pellet of gold. It was claimed that the cement will also prevent future discoloration along the margin of the filling.

BY DR. R. N. LAURANCE, LINCOLN.

No. 4. Patient, Mr. J. A. Hamson. Pyorrhœa alveolaris. The main point in the work was the instrumentation in removal of deposits—Dr. Younger's forms of instruments being used. Sulphonaphthol was used as antiseptic agent in preference to any other because it was claimed it does not stain the instruments and has a decided sedative action on the soft parts. Lactic acid was also used as a stimulant to the tissues. The work was thoroughly done.

BY DR. J. W. COLLINS, LINCOLN.

No. 5. Patient, Mr. Fred. Hudson. Gold filling in occluso-distal cavity in right upper central incisor. Tooth pulpless. Root filled with gutta-percha.

The cavity was filled with Williams' gold and platinum, shade 2, thickness 30.

Condensation was made with the electric mallet, and the finished effect was good.

BY DR. W. H. TAGGART, CHICAGO.

No. 6. Patient, Dr. Butler, La Harpe. Application of rubber dam to cervico-labial cavity in right lower first bicuspid by means of steel points, one or more, driven into the cementum of the tooth. This method obviates the use of the clamp when the cavity extends deeply under the gum margin. The application of the dam in this case gave but little pain to the patient, and gave excellent opportunity to operate upon the cavity.

BY DR. GUSTAVUS NORTH, SPRINGVILLE, IOWA.

No. 7. Demonstrated with charts and models, a method of constructing partial lower vulcanite dentures. The advantage claimed was that it prevented the plate from rocking or slipping from place during mastication, and could be worn with comfort by the patient.

This was accomplished by simply carrying or extending the pink rubber forward in the shape of a clasp to grasp the buccal or labial surface of the mesial remaining natural tooth of both sides of the jaw, the pink rubber extending down some distance upon the gum of the clasped tooth.

BY DR. H. S. LOWRY, KANSAS CITY, MO.

No. 8. An exhibit and explanation of improved dies for swaging cusps for crown and bridge work. Also dies for swaging to form the buccal or labial portion of bands for metal crowns. An anvil with plunger attachment to direct the force in stamping and pliers for holding crown during soldering. The whole set is a great improvement over this class of instruments and commends itself at a glance.

BY DR. J. W. DENNIS, CINCINNATI, OHIO.

No. 9. Applying powdered copper to interior walls of cavities, blowing same from chip syringe, the cavity previously being coated with nitro-muriatic acid. Advantages claimed, first, the arresting of decay; second, overcoming the discolored enamel margins so common when copper amalgam is used.

BY DR. J. E. HINKINS, CHICAGO.

No. 10. Building down lateral incisor corner with platinum and gold—filling first third with Fellowship gold, and finished with Williams platinum and gold foil Nos. 60 and 120, shade 2.

Time of filling, one hour and fifteen minutes. One of the features of this operation was the small number of instruments used. The cavity was prepared with two chisels, two diamond pointed scalers and three burs. The filling was inserted with two flat-surfaced round pluggers with deep serrations, and two foot pluggers of medium serrations for the platinum foil.

Cataphoresis was used to obtund the dentine, the current run up to twenty-five volts in six minutes and then held at that voltage ten minutes.

BY DR. W. V.-B. AMES, CHICAGO, TAKING PLACE OF DR. J. O. ELY.

No. 11. Obtained electro-cocaine anæsthesia in a second lower molar pulp which had been in an inflamed state for a week, making it such a case as requires an objectionable expenditure of time to accomplish anæsthesia, because of the necessity of spending much time over the preliminary anæsthesia which renders possible the crowding of the process. The apparatus used was made by Mr. M. L. Franklin, of St. Louis.

Some time was lost by the accidental dislodgment of electrodes, and the operator's unfamiliarity with the apparatus. About

one hour was consumed in obtaining such anæsthesia as would admit of depletion of the congested pulp. Then complete anæsthesia was obtained merely for the purpose of establishing the scientific fact that all inflamed pulps can be anæsthetized by expending sufficient time.

BY D. S. W. LAKIN, EUREKA.

No. 12. Restoration of the incisal third of the crown of a left upper central incisor.

The seat was ground flat in all directions, and retention was made by means of screw posts located each side mesio-distally of the pulp chamber. Watts' crystal gold was used with hand mallet, and a plugger made by breaking off the serrated end and condensing the gold with the crystallized surface of the steel.

The patient, a boy about fifteen years old, became restless and the filling was not given the finish and polish called for in a good operation.

The building up of the filling and cohesion of the gold appeared to be strong and as perfect as to be expected under a serrated point.

BY DR. C. P. PRUYN, CHICAGO.

No. 13. Patient of Dr. H. A. Potts, Bloomington. Insertion of a large gold filling in a mesio-occlusal cavity of a right upper first molar, using a small amount of noncohesive at the gingival margin, the balance cohesive. The clinic demonstrated a unique method of applying the rubber dam in cases of extreme proximal decay, extending rootwise from the gingival margin. This was done by stretching one hole in the dam over the tooth to be operated upon and the one situated mesially to it. Much of the gingiva of the interproximate space had been destroyed so that an orange wood wedge was inserted to separate the teeth and hold the dam well away from the gingival margin and also to maintain dryness.

The operation was a success in that the entire cavity was well exposed especially the gingival margin and wall. Ample space was gained for restoring full contour and to permit of giving a good finish. There was no indication of moisture during the operation.

A subsequent clinic on the same method of applying the rub-

ber dam was made on a right lower second bicuspid and first molar. The mouth being filled with water in this case also, and perfect dryness of the field of operation was maintained.

BY DR. G. B. DILLON, STERLING.

No. 14. A gold filling in a disto-occlusal cavity of a left upper second bicuspid. Sufficient space for filling and finishing was gained by means of the Ivory separator, and a matrix of thin copper was used. The object of the clinic was to demonstrate the possibility of gaining sufficient space by immediate separation for restoration of full contour and finishing, and considered from this standpoint was successful.

Your reporter would respectfully suggest that in his opinion the buccal and lingual wall should have been extended in their entire length to render them self cleansing, instead of the margins being cut convex to the buccal and lingual. This would have materially increased the seat in the gingival wall which in cavities of this class and extent is important and necessary.

A second point noticed was that in the condensation of the gold at the buccal and lingual margins, the plugger was held parallel with these margins instead of being inclined to them which was necessary, in our judgment for perfect adaptation.

BY DR. C. B. SAWYER, JACKSONVILLE.

No. 15. A disto-occlusal cavity in a left upper second bicuspid was filled with Dr. G. V. Black's modified alloy. At the conclusion of the operation the marginal adaptation appeared good so far as one could see before the filling was polished, which of course had to be deferred for another appointment to allow it to harden. The filling lacked full contour as there had been insufficient separation made.

BY DR. L. E. CUSTER, DAYTON, OHIO.

No. 16. Demonstrated use of improved electric furnace which does not burn out in practical use, by baking two gum sections. Also made an exhibit of Ash's gum body that will fuse on English teeth without changing their color.

BY DR. B. D. WIKOFF, CHICAGO.

No. 17. Making crown porcelain face bicuspid without heating

facing. The facing being retained on the backing by bending the pins over same after all soldering is done.

BY DR. G. A. THOMAS, CHICAGO.

No. 18. Baking a full upper continuous gum denture. The fusing of a porcelain crown on platinum cap, and an entire molar built up on a platinum cap. All fusing being done on the Peck electric furnace. The advantages claimed by the makers of this furnace are that it does not need a rheostat, and that the work is in plain sight during the process of baking.

BY DR. E. T. BRIGHAM, WATSEKA.

No. 19. A method of using vulcanite teeth, bicuspid and molars in bridge work. The prominent point of this clinic was the backing of rubber teeth by filing off heads of pins and soldering without investment, backing same with gold of 32 gauge.

BY DR. T. W. BROPHY, CHICAGO.

No. 20. This was an exhibition of patient by Dr. Brophy, who had previously performed an operation for empyema of the antrum which involved the frontal sinus and ethmoid cells. It was found at the time of the operation that direct communication existed between the frontal sinus and the antrum. A tube was introduced in the frontal sinus for the purpose of facilitating irrigation. Treatment, antiseptic cleanliness.

DR. F. B. NOYES, CHICAGO.

No. 21. Found it out of the question to obtain the necessary facilities to make his clinic, and was excused.

BY DR. W. V-B. AMES, CHICAGO.

No. 22. In place of Dr. J. O. Ely, Chicago, who was unavoidably absent.

DR. DON M. GALLIE, CHICAGO.

No. 23. Excusably absent. Place filled by Dr. J. E. Hinkins, Chicago.

No. 24. One of Dr. C. P. Pruyn's clinics was in lieu of Dr. I. A. Freeman, who was excusably absent.

DR. R. M. PEARCE, ROCK ISLAND.

No. 25. Was present and ready to perform his clinic, but not finding a suitable case in time, was excused.

No. 26. Dr. Nels Nelson, Chicago, was absent for good and sufficient reasons.

No. 27. Dr. P. J. Kester, Chicago, gave to the Supervisors what he deemed sufficiently good reasons to excuse him from making the clinic.

No. 28. Dr. J. H. Woolley, Chicago, gave good reason for his absence.

No. 29. Dr. C. H. West, Farina, owing to recent serious illness could not attend the meeting.

No. 30. Dr. F. Primrose, Springfield, failed to give notice for absence.

In conformity to a standing resolution of the Executive Council of this society prescribing the duties of the Supervisor of Clinics, which reads in part: "His report shall contain as thorough a criticism as possible * * * a statement of what he would have thought a better method * * * to the end that profitable and instructive discussion may follow." The Supervisor and those assisting in making this report have conscientiously endeavored to comply. Animated with the hope that whatever of criticism herein contained will be received as kindly as given, and that the future clinics of this society will continue to grow in interest and profitableness, this report is respectfully submitted.

T. W. PRITCHETT, *Supervisor.*

GARRETT NEWKIRK, }
B. NEWSOME, } *Assistants.*

REPORT OF THE COMMITTEE ON DENTAL ART AND INVENTION.*

By J. E. KEEFE, D. D. S., CHICAGO, ILL.

Your committee on dental art and invention wishes to submit the following appliances of interest to the profession:

1. Dr. J. T. Baker's Case Heater and Soldering Furnace.—

*Read before the Illinois State Dental Society, May, 1897.

This device consists of a revolving iron cup with fireproof lining, and filled with pieces of broken pumice in which to pack the investment. A forced blast of gas enters at the bottom, the pressure being governed by the gas and air valves, thereby securing a more intense and evenly distributed heat beneath and around the sides of the investment; thus there is no checking of the porcelain or warping of the bridge or plate.

2. An Improved Electric Oven, by Dr. L. E. Custer.—The improvement consists of a new system of wiring, whereby the wire cannot burn out in the practical use of the oven for firing porcelain. The wires are all exposed to view and full heat is immediately realized. It is also made in a larger size for extra large cases.

3. Dr. F. W. Blomily's Mouth Mirror Holder.—With this appliance the operator is enabled to adjust and secure the mirror in any position desired, easily and quickly, and it will be held there as securely and steadily as if held by an assistant.

The apparatus is attached to the head of the patient in a manner that is perfectly comfortable and secure and is no more in the way of the operator than the ordinary mouth mirror. Being attached to the head it is always in position independent of the movements of the patient's head. It can be used as a mirror or as a reflector to throw light down into deep cavities. It is practicable and universally applicable and will enable an operator to do his work better and more easily than without.

4. The Sawhill Universal Separator, sent by Dr. Blomily.—This separator has but one cross brace and arm and those being connected to revolving points or wedges permit the brace being turned to either side out of the way while it is in use, without removing until the operation is completed.

It is perfectly universal, being applied to the molars as easily as to the anterior teeth.

5. Improved Clasps for Dental Plate, by Dr. W. S. Elliott.—This clasp is composed of a platinum gold wire, gauge 20-22, bent upon itself to form a band or loop. This doubled wire is manipulated the same as a flat band and is made to embrace the natural tooth as required, the free ends of which may be imbedded in a rubber plate or soldered to a metallic one. The advantages claimed are :

1. Ease of construction and adaptation, no anchor piece or stay being necessary to secure it to the plate.

2. Perfect cleanliness. It will not retain the secretions of the mouth, consequently there will be no fermentation.

3. Smoothness; no angles or sharp edges to irritate the tongue or tissues.

4. Great strength.

5. Capability of more delicate adjustment after being placed in the mouth.

6. It is less conspicuous than a band.

7. It is less costly than a solid band.

6. Soldering Pliers, by Dr. W. S. Elliott.—These pliers are made with ball and socket joints so that they can be adjusted and set at any angle, and have clasps on each end to hold in any position a plate or bridge while soldering. Dr. Elliott also sends a rubber dam holder which is not new, but has never, he claims, been presented to the profession.

7. Dental Abscess Syringe, by Dr. Middaugh.—The object of this syringe is to force medicine through the apex of the root into diseased tissue and out through the fistulous opening, if there be one, thereby flushing the diseased tract. It is made in five sections, consisting of a platinum needle, a metal bulb, a valve, a rubber tube and a large rubber bulb, all being detachable. The advantage claimed for this syringe over others is that a great force can be produced insuring the flow of medicine used through the root treated, no matter how small the opening.

8 and 9. Two Matrix Retainers, by Dr. J. M. Strout.—The universal matrix carrier is so constructed that it can be attached to any sized tooth without change of matrix. It is made to carry the thin steel ribbon band matrix. By turning cap at end of barrel, you cause matrix to close around and hug, until it conforms to shape of tooth. It is not necessary to have a different matrix for different teeth; one does for all.

2. This has a hook or traveling arm, and is operated by a bur at end of barrel. This retainer can be used upon the buccal, labial, lingual and palatine surface of the teeth, and can be adjusted to fit any tooth.

10. A Steel Punch, by Dr. G. A. Widotte.—The object of this punch is to cut pieces in metal plates and bands so that they will

project, thereby enabling one to attach clasps to a plate by vulcanizing in place instead of soldering them.

11. An improved Mallet, by Dr. Widotte, with a removable handle and leather head.

12. A set of four root Scalers, designed by Dr. J. E. Keefe.—The advantages claimed for them over others on the market are, the edges are rounded, thereby causing less pain. Also an improvement on Mandrel, by Dr. J. E. Keefe, that was presented to the Society two years ago, consisting of retainer for pin which prevents it from falling out at the shank.

13. An improved Syringe, by Dr. J. W. W. Cassell, for applying remedies to pyorrhœa pockets.—They are inexpensive, so that a large number may be kept in use, allowing a separate one to be used for different medicaments in each case under treatment. A special form is made for injecting pockets of upper teeth and a special form for lower. Just back of the fine platinum tube which forms the nozzle and which is fused into a glass tube is a bulbous enlargement made by the glass blower. This acts as a reservoir for the fluid used and prevents its passage backward into the rubber bulb.

14. Electric Mallet, by Drs. Barnes and Skinner.—This mallet is so constructed that it requires a very small current to operate it. The two poles allow the armature to get within 1-100 of an inch. This result is obtained by a specially constructed magnet.

15. The Electric Armature is a dental hammer of sufficient size to absorb all magnetism. It is held at the proper distance by a spring, but has no friction to overcome, being guided only by the tool holder through the center. It can be used from direct, alternating or battery currents.

16. Scaler, by Dr. G. H. Winkler.—This scaler differs from others now in use, in having a perforation just at the cutting blade to prevent the clogging of the blade, thus allowing the deposit in its removal to pass through the opening in the instrument.

17. Lowry's system of crown and bridgework consists of a series of dies formed from natural teeth ranging in size from the smallest to the largest teeth found in the mouth. It includes dies for contouring the bands, which feature is something entirely new and effectual. The dies are of uniform size and are used in a stamper, consisting of a metallic base and a steel plunger which slides vertically in a sleeve

supported from the side by an arm in which is concealed a small spiral spring which holds the plunger in a raised position during the placing of the die, the gold plate and bullet in position, as well as to prevent rebounding of cap and die under percussion. The dies are in pairs of rights and lefts, taken from the same mouth and are absolutely indestructible.

The trial caps are numbered to correspond with the number of the die from which it was made, so there is no difficulty in finding the die wanted, after a suitable cap has been selected. Included in the system is a pair of pliers for holding the band and cap in position while soldering. They have one curved point which rests with pivotal pressure at the center of the cap, preventing tilting of the cap and allowing the heat to diffuse equally on all sides of the crown and preventing the solder from flowing unevenly. The advantages of this system over all others consist in a great saving of time and annoyance, and in the perfection of the work produced.

18. Dr. Taggart presents a new process for holding the rubber dam below the edge of the cavity in difficult cervical cases.

The process consists of driving small steel wedges into the cementum of the tooth.

In using the wedges, they are fitted into a hole in the end of a straight or curved instrument which screws into the automatic plugger in the same way that a plugger point does, or in other words, the steel wedge forms the point of the instrument, and is easily handled in this way. In order to hold the minute edge securely in place and prevent it from dropping off, the instrument is magnetized.

This process is particularly suited to very bad cases, as the distance of the cavity from the gum makes no difference in the application of the dam or wedges.

19. The Mason Ceiling Bracket.—An extension arm from ceiling for support of engine head; a device to take the place of a suspension engine or wall bracket. It has a universal joint, and is so constructed as to hold the engine head in any position required without interfering with instrument bracket or occupying any space needed for cabinet, instrument bracket or cataphoric appliances. It takes no floor space, and is always up out of the way. The joint spoken of is so constructed that a pair of pulleys attached to same for carrying engine belt is always in line for the

belt, no matter in what position you may place the engine head; making it certain that the belt will not run off when adjusting the engine to suit position desired by operator.

Any engine head can be used, thus making it available for cord engine as well as any other that a dentist may have on his foot engine.

The universal joint is so made with set screws as to provide for taking up the wear, having a steel disk between each joint to insure least wear and greatest durability. The head of the engine is set loose into bracket arm so as to give swivel movement, and the extension part of arm is governed by chuck device to lock the extension at any point. By this operation the stretch of belt can be taken up in a moment. A support for hand piece, when at rest, is attached to arm or engine head according to style of head used. The engine is intended to be run by some kind of motor.

20. Improvements demonstrated by Dr. J. W. Dennis, of Cincinnati, Ohio. Amalgam Sweaters or Pluggers.—These consist of interchangeable points of a variety of forms adapted to the variously situated and forms of cavities daily presented for repair.

At the "business end" of a cone socket shank is a disk termination, say an eighth of an inch in diameter bent to a quarter angle at the neck and armed at right angle to face of disk with a square steel spud.

On this spud the sweater, which is composed of a combination of hard and semi-hard rubber, is mounted. It is composed of two kinds of rubber in about equal proportions, the whole composing a piece, assuming various forms, about the size of a "navy bean."

These are formed and vulcanized in metal moulds, one end being hard to be perforated with a taper reamer to receive the spud on which it is simply pressed and retained during use, while the end will yield to pressure and when applied to a recently made amalgam filling no matter how dry the amalgam has been worked, will continue to draw the mercury to the surface until it has been repeatedly treated with the absorbent pads hereafter to be described.

21. Pads for Absorption of Mercury Excess Brought to the Surface of Amalgam Filling by Sweaters, by Dr. J. W. Dennis.—These are disks, cylinders and blocks in great variety of forms and

sizes composed of rubber in which tin has been largely incorporated. The combination is then subjected to the vulcanizing process; this, however, is arrested at a point which leaves the mass so that it will slightly yield to strong pressure. From a block of this the various forms of pads are cut.

For convenient use they are mounted on an instrument similar to the one before described, with this difference, that upon the before described head or disk of the cone socket shank is mounted a rotating disk armed with three or four needle points. Into a pad, cylinder or block suitable for the case in hand, these needle points are thrust, thus holding the absorbent piece in position for application to the already sweated filling from which the tin, as the pad is pressed firmly for a moment, absorbs the excess of mercury. As this part of the process goes on, the block or cylinder as it becomes charged with the mercury is rotated to suit the various irregularities, angles and margins of the filling is then removed and turned so that a fresh or uncharged surface is now represented to and pressed upon the again sweated surface of the filling.

22. The Use of Copper for Preserving Decaying Teeth Without the Objectionable Features of Copper Amalgam. By J. W. Dennis.—With a saturated solution of chloride of gold a given cavity is carefully wiped by the use of cotton wrapped on a fine broach—in deep-seated caries or very soft teeth. The nearest points of nerve exposure should either be capped or well varnished—being careful to thoroughly saturate those points where recurrent decay is most likely to appear.

Now, with a blower especially constructed, copper bronze is quickly blown into the cavity while it is yet moist. Should it be desirable to obtain instantaneous oxidation at any given point or in the entire cavity, another application of the chloride is made to the copperized surface and another coat of powder is blown on the moist surface.

Thus the cavity is lined with an oxide which, while it differs chemically from that obtained by the old-time combination of tin and gold, and recommended by such men as Palmer, especially at cervical borders or the oxidation of copper amalgam is certainly more effective because instantaneous and penetrating. By the old methods these results, always valuable, could only be reached by months or years of waiting for oxidation to take place. The

treatment here described may be repeated two or three times with advantage in some cases which of course is a matter of judgment with the operator. After each application, however, the cavity should be thoroughly dried with the warm air blower.

It is possible this method may prove very valuable in a large class of cases now known as irrepressible decay, especially in the young, where methods now in vogue utterly fail.

23. Adjustable Tooth Brush, by Dr. J. W. Dennis.—This implement is so constructed as to reach the labial and lingual surfaces and irregularities and interstices of the natural teeth more thoroughly than can a straight brush, and enabling the user to employ the perpendicular movement in cleansing the teeth so necessary to the preservation of the natural and healthy gum line. It is also capable of reaching and cleansing the recesses and pockets created by the insertion of bridge work.

24. Matrices and Wedges, by Dr. J. W. Dennis.—These consist of sections suitably formed out of ribbon steel upon the border or borders of which a lip is formed so that when the wedge, which is made of copper, dressed to a sharp edge on one side, being thicker at the opposite to represent the greater space at the gum line—is driven or pushed between the opposing tooth and the one to which the matrix is applied, the matrix will be held steadily and uniformly in position as desired and the wedge will be kept from infringing on, bruising or lacerating the gums.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

DISCUSSION ON DR. CASE'S PAPER.*

Dr. GARRETT NEWKIRK: *Mr. President:*—How thankful we ought to be to any man who comes before us and gives us the crystallized product of the hours, days and years of his industrious study of a given subject. How fortunate this Society is and has been, especially during this meeting, in having that sort of an experience. Do you realize, young men of the Society, how new dentistry is? How short the time has been since orthodontia was little more than nothing, just a mass of crude experiments. There was no analysis of force, such as we have listened to to-day,

*Paper to be published later.

but simply here and there a paper accompanied by some crude cuts, illustrating some man's experiments, with apparatus, cumbersome, awkward, ill-fitting, disagreeable to the patient and unsatisfactory in their results. It has been my fortune and misfortune to meet patients who have gone through nearly all sorts of experimentation. During my practice of fifteen or twenty years I have used nearly every kind of contrivance in the attempt to regulate teeth. I cannot express the obligation that I feel personally and which I think the profession ought to feel toward Dr. Case for his devotion to this branch of dentistry and the wonderful work he has accomplished in it. He is an artist. He cannot even put up a tack without demonstrating his neat way of doing things. Is there any one else who has demonstrated so fully the different forces of leverage and their various applications of principles to the positions and the movements of the teeth? Not to my knowledge.

I was glad, first of all, that he spoke of the importance of principles rather than attention to all sorts of details in the instruction of students. What we need, and what the world generally needs in real life, in every department of human endeavor, is the understanding of principles and an adherence to them. Principles never fail. In the end they work out their legitimate results, and the man who adopts a principle, moral or social, of honesty or absolute truthfulness, who stands by it through thick and thin, against all obstacles, against all apparent indications of policy, without selfishness or subterfuge, he is the man who in the end is going to succeed in life and be respected by his fellows. It is the same in professional matters. We must depend upon principles and in the end they will bear us out. I will say in this connection what Dr. Case has not had time to say, but probably what he would say if he was speaking to the subject, that whenever we have a case presented to us for consideration, the first thing to do is to study carefully the facial expression, the effects which have been produced by the positions of the teeth, and the development of the alveolar process. We shall be materially assisted in this when we have the benefit of Dr. Case's book, which is to be published one of those days, wherein he has laid down rules and has given us illustrations, so that we may understand far better than we can now without present means of study the laws which govern these conditions. We shall

know better than just what the effects are of the positions of the teeth upon facial expression and what corrections are necessary in order to produce the best and most harmonious results. We had from Dr. Case not long since, at a meeting of the Chicago Odontographic Society, a paper on this subject, so that I know what is in store for us in the future. I think we may esteem it an honor and a piece of good fortune that Michigan not long ago surrendered the author to us so that this work will come from an Illinois man.

Having studied the facial expression, the practitioner should take impressions and make accurate models. He should not be afraid of making too many, so that in case one should get broken he has another to fall back upon. I have had casts sent to me by dentists from various parts of the country; sometimes a partial cast, representing only six or seven teeth, and I am asked what I would do in such a case. No one can tell anything about the case so presented. Always make one, if not two, accurately articulating models to begin with, so that yourself or whoever is consulted may have the whole relation of the two sets of teeth and the jaws to consider. What may seem to be indicated by a partial cast may be entirely contraindicated by studying the whole case. If you have in view the correction of a case of irregularity yourself, do not be in any hurry; study the models carefully; lay them down and pick them up from time to time, and very likely the third or fourth time in looking at them you will discover something new and possibly very important. Do not be in a hurry about making up your mind as to what shall be done. Make models from time to time as well as measurements showing the progress of the case. Your original models are always invaluable in that they are absolute evidence as to the original condition and showing also what you have accomplished.

Dr. G. D. SITHERWOOD, Bloomington: I wish first to thank Dr. Case for his paper. There has not been a paper presented here in which I am more interested than in this. Some two years since I asked Dr. Case the question, if the time would ever come when the busy practitioner could make and use these appliances in orthodontia, with the same facility that he makes bridge work, or fills teeth. After listening to this paper my hope is renewed, and I believe we have nearly arrived at that time. The principles that he has given us are interesting and instructive. I had the

pleasure of listening to a similar paper before the Iowa State Dental Society last week, in which the essayist took the ground that it was frequently best to use very thin German silver bands, because many times the spaces were so small between the teeth. The surprising thing is the strength of the thin bands of German silver that are now furnished.

I also notice that Dr. Case rather discourages us in using the bands already prepared for the molar teeth. While I admit that it is frequently better to make our own bands to fit the teeth, yet I do not think the busy practitioner ought to be discouraged if he can purchase an apparatus already made that will fit and do the work because of the time that it takes to make many of these appliances.

The principle he has given us in banding two teeth is very useful. We all know the danger of moving a molar tooth or getting anchorage; static anchorage, as he designates it, is useful indeed. But these appliances that are now made and the teachings that the young men are receiving in our dental colleges are very encouraging, and we older members who have been plodding along in this old way will have to look after these things, or we will be outstripped by the young men. As has been stated, this matter is being taken up and is so well taught at the present time, that the time is at hand when the busy practitioner can regulate teeth, and orthodontia will be as much a part of his business as bridge work and plate work. I am encouraged in the belief that this is so. There was a time when this could not be done with the appliances that we formerly had. We are all instructed by the teachings of men like Dr. Case. Do not let us theorize about these things, but let us go home and go to work and remember the principles he has given us. If we cannot regulate the case in hand, then we should send the patient to Dr. Case.

Dr. ARTHUR G. SMITH, Peoria: I do not intend to discuss the paper of Dr. Case. I wish simply to say that I received a course in orthodontia when I went through college, and thought I knew something about it. I see now that I do not. I have learned more about orthodontia this afternoon and the fundamental principles underlying it than ever before, and I may say that I have studied carefully everything that Farrar has written on the subject and am familiar with the writings of every other man of prominence on this subject, but the words of Dr.

Case have impressed me so deeply that I hardly have sufficient self-control to speak of the tremendous field that is open to us in this matter.

Dr. G. M. BRUNSON, Joliet: I do not wish to discuss the subject, because it has already been very ably handled by the other speakers. But I would like to have Dr. Case explain Fig. 11, and ask him if he considers it safe to move the apex of this root so far without endangering the life of the nerve, even if moved very slowly.

Dr. W. T. MAGILL, Rock Island: Dr. Case has kindly told us the material he uses in this work, namely, thin bands of German silver. The great difficulty I have had is in using a wire which, after it was drawn up or pulled back, would not stand any length of time till the thread in the nut cuts out, particularly when made of German silver or nickel. When used in this way, I have been unable to find a metal that would stand everyday practice, and if there is such I would like to know it.

Dr. G. D. SITHERWOOD: I would like to ask Dr. Case to tell us, when he closes the discussion, something about regulating teeth. For instance, a great many gentlemen in regulating teeth have looked at the superior teeth, paying no attention to regulating the inferior, or paying no attention to the superior, which is quite an important thing in orthodontia, particularly in the occlusion and the articulation of the teeth. Many gentlemen have become discouraged in regulating teeth because they only gave attention to the superior teeth, particularly with reference to occlusion or articulation of the teeth. I would like him to say something on this point.

Dr. J. G. REID: It is very amusing to me when I hear discussions on papers once in a while, and especially on this particular paper. It appears to me a sinful thing for members to get up and mar by our discussions a paper that in itself requires no discussion. Dr. Case has brought before us one principle that is of practical value to dentists. It is a principle of force, and he has brought nothing here to teach you how to regulate the number of teeth that come before you for regulation. Every case that presents itself to you is different. Dr. Case has simply told you in a simple way the force that is used and how to use it. Poets were born, they were not made; and some of you may think that you can go home and regulate teeth, after you have heard what Dr.

Case has said. Of course, you will do your best, but this work requires much study. Dr. Case has been studying it for twenty years, and some of you will expect to do in one month what another man has been studying diligently for the last twenty or twenty-five years in order to attain the objects desired. He has given you the basic principles of orthodontia, which simply consist in force and how to apply it.

Dr. EDMUND NOYES: I wish to differ a little with Dr. Reid in the manner of expression rather than in real sentiment. It is fortunately the case that a man who has studied over a thing for a long time, and knows it, may be able to tell it to somebody else in fifteen minutes, so that he may know it, although the author may have spent ten or fifteen years hard study to find it out. This is one of the blessings of genius and of the possibilities of the progress of knowledge in this world, and we should bestow unmeasured gratitude on the man who has spent a lifetime, so to speak, in developing this work and then gives us the fruit of his labors. If that were not the case the world would not make any progress. A man may spend a lifetime in determining the atomic weight of oxygen and if we did not know it by what he tells us in an hour and a half, if we had to go to work and learn the thing the way he did, the world would not make any progress in scientific knowledge.

We have had an exposition of the longitudinal axis of a tooth in its relation to the alveolus and the description of the manner in which force may be put upon it by levers is invaluable to us as the basis of our thought and work in orthodontia. Perhaps this principle of force is a thing which has taken Dr. Case a long time to develop or to get a clear idea of it in his mind, but now we can see it clearly and very quickly. He gives us in a few moments the reasons for exerting force away up above the alveolar border, or away down at the occlusal end of the tooth, depending upon whether we want to move the root most or the occlusal end most. Furthermore, he gives us appliances which enable us to fix the apex of the root or the occlusal end and move the other end.

There is just one suggestion that I want to make with reference to a text-book on this subject, and that is, that every minutest detail of the construction should be given carefully. I have often heard it said by persons who have listened to lecturers in colleges and to papers in societies, that when they went home and began to make something they ran immediately against some detail

which they did not know just how to handle. They did not know just how thick to make the band, or how large a tube to use, or just what thickness of German silver to roll into the tube, and a number of other minute mechanical details that the man who is speaking has experimented with over and over, and which he failed to give in his remarks.

Dr. A. H. PECK: I shall not attempt to discuss either the paper or the subject; I do not know enough about it to do that intelligently. But I rise most cheerfully to express my true, genuine admiration of Dr. Case in connection with this work. Connected with nearly every department of our profession are more than one man of ability and reputation; but in my judgment, when it comes to the regulation of teeth, to the construction of mechanical appliances based upon true scientific principles, and their application, there is only one man in this world for me. (Applause.) While he may not be so very handsome, and I admit there is room for doubt on this point, he is certainly of high degree. (Laughter.)

Dr. CASE (closing the discussion): In reply to the question relative to the danger of devitalizing the pulp in moving the roots of teeth, I am pleased to say I have never happened to destroy a pulp in this way. I have destroyed pulps in the movement of teeth in other ways, but where the whole tooth has been carried bodily forward or back, no pulps have been destroyed. I do not know when it will occur. I think you would be surprised to see some of the teeth under the influence of this contouring force. Usually, in applying a contouring force to the four incisors of young people, the entire intermaxillary portion of the alveolar process, in which the incisors are embedded, seems to be forced forward or backward with the roots; but occasionally I meet cases in which the movement seems to be accomplished by absorption of the process, and in those cases the roots of the teeth often stand out so prominently that I am somewhat alarmed. When I see this condition, I let up on the force, but my experience has been that I have never destroyed the pulps.

I hardly think it advisable for me to attempt to reply to the many things which arose in the discussion. My paper was confined to one branch of orthodontia. One thing however was said, that was quite discouraging, in reference to whether dentists could learn to regulate teeth. It is my one hope, if I have any

hope in the world greater than another, to establish some universal principle upon which all dentists can take up different cases and properly regulate teeth. (Applause.)

I thank the society, as I have had occasion to do before, for their very complimentary words, which were far more than I deserve.

DISCUSSION ON TO WHAT EXTENT ARE WE JUSTIFIED IN USING CATAPHORESIS AND IS THERE DANGER OF INJURING THE
DENTAL PULP AND OTHER TISSUES
BY ITS USE?

Dr. W. V-B. AMES was called upon to open the discussion. He said: In answering the second question the first is effectually disposed of, as I understand it, for in proportion to the probability of injury to tissue, would the process be contraindicated. If there is no probability of injury to tissue we are then justified in employing the process whenever the conditions call for this form of anaesthesia and the patient is willing to recompense us for the time required if we are considering it wholly from a pecuniary stand, and oftener if from the point of charity and humanity.

I have heard recited a number of cases of bad results which seem to have followed the use of cataphoresis. I have not had any experience which would contraindicate its use, wherever it seems to be called for, but in carefully studying this subject I can see what might possibly be causes of some of the bad results, but I cannot give a scientific reason. I believe Dr. Black has thrown out the suggestion that there may be a possibility of carrying—I do not remember the exact term he used—ptomaines into the tissues.

Dr. PECK: I believe the term used by Dr. Black was toxalbumin.

Dr. AMES: What is a ptomaine?

Dr. PECK: A ptomaine is the product thrown off by the living bacteria.

Dr. AMES: Whether of an alkaline nature or not?

Dr. PECK: That I cannot say in all cases. It will depend upon the class of microorganisms we are dealing with.

Dr. AMES: I am endeavoring to ascertain some facts in this connection, and I am told that there is an alkaline product thrown off by the bacteria. I had supposed that the effete matter thrown off by the microorganisms was acid, while if there is a poisonous

alkaline product there of any kind it would be carried toward the negative pole, the same as the alkaloid cocaine. It seems to me this is the only possible explanation for the injurious results of which we have heard so much, following cataphoresis. I have not seen such cases myself. While I am an enthusiast in this matter, I do not use it on every patient or on the majority of my patients. I may work along for two weeks without seeing the necessity of employing cataphoresis. In the use I have made of so-called cataphoresis I have not seen bad results, and such results may have been directly attributable to the fact that some poisonous matter may have been carried in, which would, on account of its chemical nature, go for the negative pole the same as cocaine does.

"Is there danger of injuring the dental pulp or other tissues by its use?" When an infinitesimal quantity of cocaine is introduced into the pulp tissue, I believe the pulp will rally, and I feel when we have accomplished the results we have simply carried the cocaine into the pulp tissue to the extent we need for the anæsthesia. When we are able to bring the anæsthesia to the point where the patient is not conscious of the current any more, we stop there; we do not carry the cocaine effect into the tissues beyond. I do not see where the disadvantage would be, even if we did carry it into the tissue beyond. It goes into the circulation of the pulp, and is carried off just as a patient recovers from general anæsthesia.

Dr. S. F. DUNCAN, Joliet: I have been using cataphoresis to some extent for a few months, and there is no question about the matter as to whether we can anæsthetize a pulp or tooth with it. We know we can. I must confess of having had a little fear in using it. I have always been afraid of the reaction after the effect of the cocaine has passed away, and question whether the reaction would not produce a condition of the pulp that might eventually result in its death. That is the principal fear I have had in the use of it.

So far as burning the gum or anything of that kind is concerned, I have not had any unpleasant or bad results from it in that way.

Dr. J. A. W. DAVIS, Galesburg: My partner and I have been using cataphoresis for nearly a year. We use it quite frequently, and have not had any bad results. In a case in which the pulp is inflamed we do not succeed as well. We have not had a case, so

far as I know, where there has been any trouble after the tooth has been filled. We destroy the nerve with it, take it out, and fill immediately in every case. It does not take more than half an hour to forty minutes to destroy the nerve. It is generally done without any pain, but occasionally there will be a case where the patient will complain of pain in having the nerve removed with cataphoresis.

We have the Wheeler volt selector and a part of the works of a clock being attached to it—by letting the band which runs the dental engine pass over one of the wheels the volt selector is turned so gradually by the motor that the patient does not notice it.

Dr. A. H. PECK: I simply wish to state regarding the micro-organisms or their products, or whatever it may be that is carried into the tissue by the current, that Dr. Black's idea is that it will destroy any and all living tissue with which it comes in contact, the idea being, I presume, that if any of these ptomaines are carried by the current into the tissues, they will irritate the pulp, and the pulp in turn will be destroyed by them.

Dr. C. S. CASE: This is a subject that I know very little about, but there is one point that has struck me very forcibly, and that is, the claim made at this meeting, and the Chicago Dental Society, in reference to carrying broken down ptomaines and other substances as substance along on the current. It seems to me, that this is something we have nothing specially to deal with. It is going beyond the possibility of our brain to attempt to say just how the causes of the effects are. It is not possible in my opinion, for any substance or chemical compound or any decomposed particles to be carried along on a current of electricity. What is it that produces the anæsthetic effect? It is something that sets up a vibratory force, which in turn inhibits the activities of the nerves and produces a deadening of the sensibility. Probably it is purely a vibratory action but we may never know.

There is no doubt in my mind but that all local and general anæsthetics act by virtue of the inhibitory power upon vibrations, and when we use electricity along with cocaine we merely intensify the activity of the drug. You might as well say that you can carry substances along the current of a telephone wire; or something besides vibrations or whatever the unknowable force is that transmits the human voice.

I see no reason why we should so frequently feel called upon

to give a specific account of objective phenomena that belongs to a realm of which we can ever know little or nothing.

Dr. EDMUND NOYES: It is equally possible, as a matter of theory, that the cocaine itself as a physical body is carried to the pulp and affects it as it is, that the effects upon the pulp are purely dynamic. The facts that cocaine applied to such a cavity will not produce these effects, and the electric current alone will not produce them, and the electric current is used in other situations for the sake of the more rapid diffusion of medicines into a wider territory, all these make it plausible that the cocaine itself penetrates the dentinal tubuli and affects the pulp, and not merely as a dynamic vibratory force. I am not saying that it is so. This is a subject that we are anxious to know more about both clinically and scientifically. The question arises whether the poisonous products of the decompositions that are going on in the cavities of teeth may not be diffused by the stimulation of the electric current, and eventually carried to the pulp and poison it by the same means and under the same stimulus that the electric current carries the cocaine there. I am anxious to know whether there is a clinical history of dying pulps following the use of cataphoresis, and that question I have not heard answered with any definiteness or with any detail.

Dr. P. J. KESTER, Chicago: The question of the transmission of sensation over the nerve or the destruction of sensation in the nerve by cataphoresis is one of great interest. A few days since some one kindly sent us a dental journal in which there was an article by F. X. Dercum entitled "The theory of the movement of the neuron" nerves. I have not studied the article carefully, but after having read it once, it seems to me to be the most reasonable explanation of the transmission of nervous force that I have seen. It was described as a sensation depending upon an extension of the protoplasmic processes of the neuron of the nerve cells; that as the nerve was irritated these processes were extended until they approached each other, and it was through the contact of these processes that nervous energy was transmitted. The author also explained the conditions of hysteria, insomnia, and other things, describing them as an irritation or extension of these processes. At the time of sleep or inactivity, these processes are quiescent and do not approach each other, but under irritation and excitement they extended them-

selves and formed a circuit which produced peculiar nervous sensations, and when these sensations are abnormal they become indications of disease, more particularly in the nervous diseases, like hysteria and other affections.

The statement was made by some one that the anæsthesia produced by cataphoresis depends on two things, the presence of cocaine and the electric current. Dr. Perry seems to have demonstrated that cocaine is absolutely unnecessary. He finds that he can produce anæsthesia of the pulp to a degree sufficient to remove it, by the application of the current alone. So the condition of anæsthesia depends more upon the action of current upon the protoplasmic prolongation from the pulp into tubuli, with the retraction of the neuron of the pulp proper than it does on the remedy which is supposed to be transmitted through the hard tissues.

Dr. E. T. BRIGHAM, Watseka: I have only had a limited experience with cataphoresis. With it, as with everything else in our practice, we cannot use it on every patient with success. It would not do to apply it in every case that comes to you. There are cases, however, where it is beneficial. I have used it several times with success, and in other cases without success. As Dr. Kester has just said, it is hardly ever a success without the use of cocaine. I have tried it without moistening the cavity and have always failed. I have failed also where I have used cocaine, but in the majority of cases in which I have used cocaine, and my patient was a good subject, I have had perfect success. I believe it is a good thing. As to whether it will injure the pulp afterward, I cannot say.

Dr. J.^oG. REID: I believe the subject under consideration is a very important and interesting one, and it is now in a state of exalted sensibility, if you please, and we are inclined to jump at things of this character because certain results have been obtained. This is the natural inclination, and we are striving to get something with which to relieve the pain and remove the horror of dental operations. I am free to admit that cataphoresis comes more nearly filling the requirements than anything that has been used heretofore; at the same time, it is an agent that we know very little about. We may regret that we are using it to the extent we are at present. Of course, we hope not, but we may, and my experience with the use of it has been rather conservative. That it does what it is intended to do there can be no question, and if you have failures in

accomplishing what you start out to do, I do not believe it can be attributed to cataphoresis itself, but rather to some defect in your apparatus or in your application. I will be honest in saying, that I have never in all my experience had a failure with the use of the machine. I have had what seems to be impartial anæsthesia, but I can account for that on the ground of not following out certain details in order to make the operation a success. I did not carry the process to the extent of complete anæsthetization of the pulp, which I think can be done in every instance if time is taken to do it. I believe we can anæsthetize the contents of the tubuli without anæsthetizing the entire dental pulp, and if anything should arise in the way of injury to the pulp, of course you could prevent it. In my opinion it is only necessary to anæsthetize to the depth to which you intend to cut in the dentine. Of course, the density of the dentine and the conditions existing in it, in all probability, vary the application of the current, and you cannot determine beforehand to what extent anæsthesia has taken place except by trial. There is no rule to govern us in this regard.

I do not believe it is a good agent to use for the extirpation of dental pulps. We make a great mistake in using cataphoresis for the purpose of removing pulps of teeth. There are times when this would be advisable, particularly in cases of emergency. In emergency cases it might be desirable to use cataphoresis to remove the dental pulp, but I have my doubts about being able to do so at one sitting. You are all familiar with the tissues of dental pulps; you know they are tenacious, and that it is almost impossible by employing the old methods of destroying pulps to remove them in their entirety. In the majority of cases they are very hard to remove, and how much more difficult are they to remove in the condition which exists than they would be if allowed to go a certain length of time, so that Nature might assist us in getting rid of that tissue. If allowed to go a little while you can pull out the pulp in little threads; but you are never sure of removing the entire pulp at one sitting, when you have used cataphoresis for anæsthetization and for its removal.

Hæmorrhage in many cases is a very conspicuous feature, and we must not, if possible, allow the accumulation of blood clots in the pulp canal which naturally will occur, and when they are allowed to remain in the pulp canal for subsequent decomposition to take place they are an element of danger. It is not in all cases

that hæmorrhage occurs, but it does occur in many of them, and I believe on account of hæmorrhage and its control, that cataphoresis is not a good agent for the immediate extirpation of pulps.

I have used cataphoresis for a year, but I do not use it daily because of the time consumed in its application. If I have cavities that require half an hour or more in their preparation, I would save the time by using cataphoresis in the end. In a measure the dentist regulates his patients; he has people coming to him constantly who are under his care, and he does not allow the cavities to become so large as to require a day to prepare and fill them. The cavities that I ordinarily get, not in all instances, can be prepared in ten or fifteen minutes. Now, it would be a waste of time for me to use cataphoresis in such cases, and consequently I am deprived of using it more frequently than I do. I should hesitate to use it constantly.

Dr. G. M. BRUNSON: There are one or two questions I would like to ask Dr. Davis. First, if he uses cataphoresis extensively in excavating sensitive cavities. He spoke of the extirpation of pulps with its use.

Dr. DAVIS: Not extensively, but quite often, not even every day, unless I have to.

Dr. BRUNSON: In regard to cataphoresis, it is certainly very useful to us at various times. But there are some objections to its general use. First, the amount of time it takes to use it in our general practice; second, the danger to the pulp. None of us can now positively tell whether or not these pulps may not be injured or die months or even years after its application. If any of the members of the Illinois State Dental Society use cataphoresis extensively in excavating sensitive dentine, I should like to hear their views on the subject.

Dr. R. N. LAWRENCE: I have been using cataphoresis for probably ten months in a conservative way for the excavation of sensitive dentine, the extirpation of pulps, for the extraction of teeth and for the sterilization of putrescent root canals, and I only use it in cases where it seems to be absolutely necessary, particularly so far as the excavation of sensitive dentine is concerned. I would not resort to it if I could get along without it.

Dr. Black has made the suggestion that the excrement from the cocci or germs might be carried through the tubuli to the detriment of the pulp. There may be something in this, or there

may not be. My understanding is that electricity itself may not produce any serious results, but the carrying of the medicine or any germs into the tissues or their ptomaines might produce deleterious results in the future, and as a consequence it would eventually cause death of the pulp. I have had excellent success in obtunding sensitive dentine with cataphoresis, and also in the extraction of teeth, but I have not used it very much for the latter purpose. The guaiacol preparation would be satisfactory in the main, with the exception that it takes too much time and the escharotic effects of the guaiacol are unpleasant, and on this account I have abandoned it so far as that is concerned. I have tried it in two instances for the sterilization of pulp canals, and I set up considerable irritation. I have no doubt that I carried some of the ptomaines through. I only used chloride of sodium and it created a good deal of irritation. My fear in connection with its use has been that we might produce in sensitive dentine a certain amount of paralysis by long continued use, and that the nerve would die afterward.

As to the current carrying physically any of these germs or their ptomaines, I have my doubts. I do not question Dr. Black's judgment in this matter.

Dr. P. J. KESTER: I regret that this subject did not come up a little earlier in the session, because it is one of importance. I have used cataphoresis somewhat, but have been afraid that its after effects might be detrimental to the pulp. We have not used it long enough to discover the bad results or to see the manifestations from such disturbances. We know that a pulp may die in a tooth and under favorable conditions remain quiescent for years. I believe that we ought to use cataphoresis very carefully until it has been demonstrated that there is little or no danger attending its use. We also know that pulps die from what would seem to be insufficient irritation, such as changes in temperature and slight shock, and the question arises if the shock which absolutely deadens the pulp, may not be sufficient to entirely destroy it.

I want to enter my protest against the practice of extirpating pulps by this method. I know it is possible to extirpate a pulp by cataphoresis, fill the cavity immediately, and have apparently good results. I do not believe it is scarcely possible to remove all of the particles of the pulp and thoroughly prepare the root for filling at one sitting. I do not believe a cavity under such circum-

stances is in a good condition to fill. In rare cases it may be done, but the practice is a dangerous one and will be unsatisfactory.

Dr. W. V-B. AMES: On seeing the program I prepared to show some experiments and to demonstrate a few of the underlying principles of so-called cataphoresis, which I claim is simply an electro-chemical process. Later I was asked to take the place of Dr. Ely as clinician. I have had some transparent preparations made in which I was going to show the actual transmission of compound substances and simple substances, and to point out that they are not always carried from positive to negative. The carrying of substances into the tissue is simply the transmission of electro-positive and electro-negative elements in certain directions according to their affinities or nature. So I claim, as I did before the Chicago Dental Society, when I took another man's place and opened the discussion, that there was no excuse for coining the word cataphoresis, according to my opinion. The term is convenient enough, but there is nothing scientific about it, except that the name is suggested by the cathode. The general impression is that cataphoresis, is something occult, as Dr. Case would infer; that it is something we have no way of getting at, and some seem to think we will never know anything about it; that it is a peculiar flow created by the current, carrying with it whatever you may put there. It is not the case at all. I am satisfied there is a flow, but it is created by the elements which are set in motion by the polarity established, the positive elements traveling toward the negative and the negative toward the positive. As the electro-negative or electro-positive elements predominate in the compound, the flow of the solvent will be created in the direction of the movement of the elements which predominate. This flow is a secondary matter, depending upon the predominance of one or the other elements. In the majority of compounds there is a predominance of the electro-positive elements which would go to the negative pole; in the majority of instances the flow is in that direction. Ordinarily with water you have your H_2O , you have twice as much volume going in one direction as the other; you have a flow created in that direction. In the solution of hydrochlorate of cocaine I cannot give the formula off-hand, but you have HCl and the cocaine formula which gives you forty to fifty volumes of alkaloid in proportion to two volumes of acid. You

have one going in one direction, the other in the opposite direction; you have a great volume comparatively going toward the negative pole, and your HCl remaining at the positive. There is the whole thing to me in a nutshell. It is not the flow you create which does the work, but it is the carrying of potent substances in a certain direction where you want to place them, and the flow is secondary.

I want to protest against people talking about this process and saying, "I have used this machine for this and that condition." With all deference to my friends, it hurts my feelings to hear them speak of using this machine with which to do certain things. I would not quarrel over a term if it is convenient and answers the purpose. If I were to suggest a term, I would call it the electrolytic transmission of radicals, or simply "electrolysis," which means simply a breaking up of the compound and carrying the radicals in two directions. The radical may be a simple element, or it may be compound.

Reference has been made to the use of cataphoresis for the purpose of immediately extirpating pulps and filling root canals. I do not use it that way myself. I have, however, in one or two cases of emergency attempted to do such a thing, but I should say it would be only excusable in emergency cases, and even then I should want to do it over when an opportunity presented itself.

I would object to working my device in a given way, as, for instance, by clock work, as referred to by Dr. Davis, for the reason that there are no two cases alike. You may have a case where you can turn the current on rapidly, but in a case where the pulp is inflamed you have to go very slowly.

I would not use the guaiacol solution spoken of by Dr. Lawrence, for I believe he can accomplish just as much with a plain water solution or a solution of electrozone, and it has not the objectionable effects of the guaiacol.

MINNEAPOLIS DENTAL SOCIETY.

DISCUSSION ON DR. HARTZELL'S PAPER ON "THE CARE OF DECIDUOUS TEETH."

Dr. BAILEY: In opening this discussion, one must say that Dr. Hartzell has succeeded in giving us a very interesting paper upon a subject that is both old and trite, a task by no means easy

of accomplishment. I think that I have had fair success in treating children's teeth. Though it is still as much of a problem, in some ways as it ever was, brought to us as they are; often after a night's suffering, and frightened by the stories of older children, or unwise parents. In getting the confidence of the child the presence of the mother is often more of a hindrance than a help, but if the child has been taught to respect the mother's word, and she can control herself so as not to add her own to her child's fear, the mother's presence will be found to be a most valuable aid. Thorough work is largely out of the question with our little patients, and long sittings equally so; to remove the softer portion of the decay, form the margins carefully, and fill with some one of the oxyphosphates or an amalgam is usually all that it is best to try to do. In the treatment of pulpless teeth, I have found that the peculiar physiological processes incident to this period of life a great help. The cavity of decay, as also the pulp chamber, must be cleansed of all putrid matter, and rendered aseptic, at the expense of a second sitting if necessary, and then fill the cavities, of decay and pulp with one of the oxyphosphates, leaving the root canals untouched. I have never had any aftertrouble with a tooth treated in this way, even though a fistulous opening had been formed through the gum. I want to most heartily commend what the essayist has said in reference to the care of children's teeth at home. It is impossible to urge this too frequently, or too strongly, upon the attention of the parents. I think there is a great improvement in this respect among mothers, both in the watchfulness for the appearance of decay, and also in the use of the brush; and their children's teeth are correspondingly improved.

Dr. T. E. WEEKS: It seems to me it will be wiser in any remarks I make, to dwell more particularly upon the manner of gaining possession of these youthful patients, rather than how to treat them afterward, especially as there are so many young men present. I think methods will readily present themselves to any practitioner of the present day, for methods are thoroughly well taught. What to do in each individual case must be decided by the conditions that exist in that case.

Bear in mind that the first object is to do as little, occupy as little time and inflict as little pain and inconvenience upon the patient as possible in getting good results. We may hesitate to ask that these little patients be sent to us, but it should be done

for the good of the child. It is from experience that I speak of the necessity and the duty we owe to our patrons and the community, not to hesitate to urge upon parents, in many cases even demand that they bring their children to us. I think when people do us the courtesy or pay us the compliment, of entrusting their own teeth to our care, they will understand this matter when the subject is presented to them in the proper manner, and that they will accept the suggestion in the spirit in which it is intended.

Some think that we must not do these things for fear people will think we are begging for business. However, this argument can be raised upon a higher plane than that—it can be placed upon the plane of humanity—saving suffering, contributing to the improvement of mastication, and the subsequent improvement of the whole physical being of the child. There is no one who carries this to a greater extent than Dr. Bonwill, who insists that the parents shall bring their children to him when they are three years old, and from that time at regular intervals, and he boasts that he never has any cases of irregularity, except of a hereditary nature, or any of those ills which arise from a lack of care of the teeth.

There is no necessity to call your attention to an aseptic condition of the mouth more than to mention that where decayed teeth exist, that there will be an unhygienic condition of the mouth, a septic condition, the fluids will be vitiated, and all attending evils will follow in its train.

The handling of children is a great study, and there can no rule be laid down. A mother can come for a protracted operation and bring the child with her, especially if she is a good patient, but as a rule children should not be permitted to witness operations upon another.

I would like to call the attention of the society to something that I have used to great advantage. I had occasion to use it for permanent teeth in the mouth of a young lady where the teeth were absolutely melting away. I refer to Ames' oxyphosphate of copper. It is a compound of black oxid of copper and phosphoric acid solution. Some care is necessary in its preparation. After the liquid has been permitted to take up so much of the powder as it will absorb, the mass should be thoroughly triturated, adding powder a little at a time until the mass is as stiff as soft putty. In

mixing and using, instruments of noncorrosive material should be used.

It becomes very hard, and will stand mastication very well. In the case of children's teeth, in arresting destruction of tissues, or in sensitive cavities of adults, it works very nicely. Many of my Chicago friends have given glowing accounts of the use of it. The only objection is on account of its jet black color, but on the whole it has given great satisfaction. It is very easy to apply, and quite adhesive. It is not necessary to prepare the cavities with a great deal of care. It seems to have a prophylactic action. It has more the nature of an amalgam than of a cement, but it will not stand attrition quite so well. However, it can be attached to surfaces that are not perfectly dry. One of its advantages is that it has an affinity for moisture, so a small amount of moisture is not detrimental to its use.

Dr. A. T. SMITH: In regard to using powdered nitrate of silver, mentioned by the essayist, I do not see how to use the solution after having used the powder. Almost invariably you get the darkened surface after you have taken out the broach. I have never failed in a single instance, if you can keep the tooth dry, which can be done with a small napkin. Take a broach holder and a piece of a Japanese toothpick, and plane the square end a little, about one-fourth of an inch long; put it into the broach holder, moisten the end of the piece of wood, put it into the powdered nitrate of silver, and you can work it around in the cavity to perfection and darken the surfaces, with no danger of its getting on the gum. I do that to grown people in the majority of cases where the teeth are soft and break away from the filling. With the use of the nitrate of silver you get a hardened effect of the surface.

In regard to gaining the confidence of children, I have seen children play with the ball of mercury on the carpet for hours, trying to pick it up. It is the same in regard to cutting off strips of rubber and letting them play with them. It will accomplish wonders in getting their attention. When I first came to the city I remember Dr. Spencer, who was the most wonderful man to get the attention of children of any one in the city. He was an eccentric man, but he had a wonderful faculty in enlisting the confidence and governing children, and I have never forgotten him.

Dr. I. C. Sr. JOHN: The most difficult cases are those where

there is exposure of the pulp in proximal cavities, and Dr. Kremer has the easiest way—he extracts. Where one does not wish to extract, I think it is well to devitalize the pulp. I would watch it a little closer than I would an operation for an adult. If there is severe pain it should be stopped in some way. When I make an application of that sort I do it without having any pressure on the pulp whatever. I do not cover it with a pledget of cotton or sandarac, but for a surface I usually use thin cement, and cover that with a sandarac solution. When it comes to the first permanent molar, if there is but little of it left, I think it ought to be extracted.

One word in regard to carrying powdered nitrate of silver on gutta-percha to a sensitive dentine surface. The base plate gutta-percha is the proper kind to use.

This should be rendered aseptic and softened by first dipping it into eucalyptol and then passing it through a flame and repeating the operation, if necessary, until the gutta-percha is quite soft enough to not only pick up the nitrate of silver powder but also to be readily adapted to the sensitive surface of dentine to which it will readily adhere and may be adapted with ease providing it is carried into the cavity on a piece of asbestos, which is left external to it.

Dr. M. V. HARTZELL (closing the discussion): I have not been practicing dentistry very long and find that I have quite a few things yet to learn. Some of the points in my paper I made in the way I did hoping that some of you would help me out and my hope has been amply fulfilled. In regard to the devitalization of temporary teeth, I do not quite agree with Dr. Kremer in all cases. If the tooth would soon be lost any way I should then extract it, otherwise I think the benefit to be derived from its retention would warrant the conservative measures necessary. The method I mention in relation to the application of silver nitrate I have never used myself, but have read of it several times and wished to know how generally it was practiced.

AMERICAN—SOUTHERN.

NATIONAL DENTAL ASSOCIATION.

REPORT BY LOUIS OTTOFY, D. D. S., CHICAGO.

The members of the American and Southern Dental Associations met by agreement at the Hygeia Hotel at 12:30 o'clock, noon, August 5, 1897.

The meeting was called to order by Dr. Thomas Fillebrown, of Boston, Chairman of the Committee on Union.

Dr. John B. Rich, of Washington, D. C., was elected temporary chairman.

Drs. W. E. Walker, of Pass Christian, Miss., and Geo. H. Cushing, of Chicago, were elected temporary secretaries.

On motion, the body was organized under the name of the "National Dental Association."

A Constitution, By-Laws, Rules of Order and Standing Resolutions prepared by the Committee on Union were then read and adopted.

On motion, each speaker was limited to three minutes.

The association proceeded to the election of officers with the following result: Thos. Fillebrown, President, Boston, Mass.

The President-elect was then conducted to the chair by Drs. Truman and Richards, respectively Presidents of the American and Southern Dental Associations, and installed.

Adjourned until 4 P. M.

The National Dental Association reconvened at 4:30 P. M.

Dr. Geo. H. Cushing, of Chicago, was elected Recording Secretary; Dr. W. E. Walker, of Pass Christian, Miss., was elected Assistant Recording Secretary; Dr. James McManus, of Hartford, Conn., was elected Vice President from the East; Dr. L. L. Dunbar, of San Francisco, Cal., was elected Vice President from the West; Dr. B. Holly Smith, of Baltimore, Md., was elected Vice President from the South; Dr. Emma Eames Chase, of St. Louis, Mo., was elected Corresponding Secretary; Dr. Henry W. Morgan, of Nashville, Tenn., was elected Treasurer.

On motion, in lieu of electing an executive committee, the President was empowered to appoint the committee.

On motion, the Treasurer was authorized to transfer the names

of the permanent members from the former American and Southern Dental Associations to his books, and that such transfer shall be the legal signature of all such members to the constitution of the new organization.

Omaha was selected as the next place of meeting. The President announced that he appointed the following as the Executive Committee: For three years, L. G. Noel, of Nashville; V. H. Jackson, of New York; J. N. Crouse, of Chicago. For two years, M. F. Finley, of Washington; J. D. Patterson, of Kansas City, and H. A. Smith, of Cincinnati. For one year, Geo. Eubank, of Birmingham (Ala.); W. P. Dickinson, of Minneapolis, and C. N. Peirce, of Philadelphia.

A motion was adopted to appoint a committee of three to consider the advisability of establishing a journal of the Association.

A resolution was adopted expressing it as the sense of the association that where a certificate of registration and of good professional standing has been issued in one State, such certificate shall entitle the holder to practice in any other State of the Union.

A resolution was adopted authorizing the President to have printed and to send to all members a copy of the Constitution, By-Laws and Rules of Order.

A resolution was adopted to the effect that each of the dissolving associations shall contribute one dollar for each member on each list into the treasury of the National Dental Association.

A resolution was adopted empowering the President to appoint a committee of three to consider the advisability to publish a history of the dental profession.

Adjourned till to-morrow at 12 o'clock noon.

FRIDAY, AUGUST 6.

The National Dental Association reconvened at 1 P. M.

The President announced the appointment of the following committees:

Publication Committee: Geo. H. Cushing, A. W. Harlan and V. E. Turner.

Committee on Dental Museum and Library: Wm. Donally, H. W. Morgan and Thos. Fillebrown.

Committee on Terminology: S. H. Guilford, Grant Molyneux and S. W. Foster.

Committee on Journal: John S. Marshall, J. Taft and L. G. Noel.

Committee on History: James McManus, R. Finley Hunt and Gordon White.

The Executive Committee announced the following organization:

Chairman, J. N. Crouse; Secretary, M. F. Finley. Section on Arrangements, Drs. Crouse, Noel and H. A. Smith. Section on Credentials, Ethics and Auditing Accounts, Drs. Jackson, Patterson and Finley. Volunteer Essays, Drs. Peirce, Dickinson and Enbank.

The President announced the following appointments as officers of the sections:

Sec. I. Prosthetic Dentistry, Metallurgy and Chemistry. Chairman, Grant Molyneaux, Cincinnati; Secretary, R. R. Freeman, Nashville.

Sec. II. Dental Education, Literature and Nomenclature. Chairman, B. H. Catching, Atlanta; Secretary, M. F. Finley, Washington, D. C.

Sec. III. Operative Dentistry. Chairman, J. Y. Crawford, Nashville; Secretary, Frank Holland, Atlanta.

Sec. IV. Histology and Microscopy. Chairman, John J. Hart, New York; Secretary, T. P. Hinman, Atlanta.

Sec. V. Materia Medica and Therapeutics. Chairman, J. S. Cassidy, Covington, Ky.; Secretary, L. P. Bethel, Kent, Ohio.

Sec. VI. Physiology and Etiology. Chairman, J. D. Patterson, Kansas City, Mo.; Secretary, L. E. Custer, Dayton, Ohio.

Sec. VII. Anatomy, Pathology and Surgery. Chairman, W. C. Barrett, Buffalo, N. Y.; Secretary, Geo. B. Clement, Macon, Miss.

Sec. VIII. Hygiene and Prophylaxis. Chairman, L. G. Noel, Nashville; Secretary, A. H. Thompson, Topeka, Kan.

Sec. IX. Orthodontia. Chairman, V. H. Jackson, New York; Secretary, L. P. Dotterer, Charleston, S. C.

Sec. X. Clinics. Chairman, H. J. McKellops, St. Louis, Mo.; Secretary, E. P. Beadles, Danville, Va.

On motion, both societies were requested to print the minutes of the National Dental Association in the transactions of both societies.

A motion was carried to appoint a committee of one from each State and Territory and the District of Columbia, who is to

see to it that the delegates to the meetings of this association shall be members of the Dental Protective Association.

By vote, practitioners of fifty or more years may become members without the payment of dues.

A resolution requesting the government to appoint some dentist in the department of the Medical Army Museum and Library at government expense was, on motion, adopted.

The committee invited returning members to stop at Washington and visit the Museum and Library.

A motion to appoint a committee of three on local societies to foster and aid them, was adopted.

On motion, the two societies were requested to deposit their gavels in the Medical Army Museum and Library in Washington.

On motion, the National Dental Association adjourned to meet at Omaha on Tuesday, August 30, 1898.

SOUTHERN DENTAL ASSOCIATION—OLD POINT COMFORT, VA., AUGUST
3 TO 6, 1897.

At the opening session an address of welcome was delivered by Dr. J. V. Haller, of Wytheville, Va., and was responded to by W. W. H. Thackston, of Farmville, Va.

The President, Dr. W. H. Richards, of Knoxville, Tenn., delivered an annual address.

The report on "Operative Dentistry" was read by Dr. Frank Holland of Atlanta, Ga.

The report on "Prosthetic Dentistry" was read by Dr. W. E. Walker, of Pass Christian, Miss.

The report on "Dental Education" was read by Dr. John S. Marshall, of Chicago.

Papers were read as follows:

"Obscure Case," by Dr. W. E. Walker, of Pass Christian, Miss.

"The Ideal Crown in Connection with Orthodontia," by Dr. I. N. Carr, of Tarborough, N. C.

"The Facial Line and Angles in Prosthesis," by Dr. W. E. Walker, of Pass Christian, Miss.

"Compatibility of Filling Materials and Tooth Structure," by Dr. I. N. Carr, of Tarborough, N. C.

"Does the Present Method of Teaching by Didactic Lectures

Best Qualify the Student for the Practice of his Profession?" by Dr. John S. Marshall, of Chicago.

"Replantation in Pyorrhœa Alveolaris" by R. E. Paine, of New York City.

On Wednesday evening, the members of the association attended the stereopticon lecture of Dr. I. N. Broomell at the meeting of the American Dental Association.

On Thursday evening before the Southern Dental Association the following two papers were read: One illustrated by the stereopticon: "The Comparative Study of Text-books" by Dr. T. P. Hinman, of Atlanta, Ga., and one on "The Prominent Cause of Failures in the Use of Electricity in Dentistry" by Prof. C. S. Neiswanger, of Chicago.

During the four days' session the following clinics were given: Dr. D. J. McMillan, Kansas City, Mo., filling with noncohesive gold, or a combination filling with cohesive and noncohesive gold; Dr. R. Ottolengui, New York, gold filling; Dr. F. F. Fletcher, St. Louis, Mo., the relation of orthodontia to ideal bridgework; Dr. Frank Holland, Atlanta, Ga., gold contour, using electric mallet; Dr. W. J. Brady, Kansas City, Mo., fitting regulating appliances to models and exhibit of models with appliances in place; Dr. Robert Eugene Payne, New York, implantation, using Davis crown.

Dr. W. E. Walker, Pass Christian, Miss. Demonstration with Walkes Facial Clenometer.

CATAPHORESIS CLINICS.—Dr. T. M. Allen, Birmingham, Ala., obtunded sensitive dentine on labial cavity of incisor or cuspid.

Dr. C. L. Alexander, Charlotte, N. C., demonstrated the use of fibriformed tin, as distributor of the anæsthetizing agent in cataphoresis.

Dr. L. E. Custer, Dayton, Ohio, sensitive dentine.

S. Eldred Gilbert, Philadelphia, Pa., sensitive dentine.

Dr. W. M. Hollingsworth, Philadelphia, Pa., sensitive dentine.

Dr. H. C. McBriar, Middletown, N. Y., treated a chronic abscess.

The association at its meeting on Friday decided to donate its copies of transactions of past years to the Army Medical Museum and Library at Washington, D. C.

Dr. W. W. H. Thackston presented a report on Prosthetic Dentistry.

The members of the Southern Dental Association then organized themselves into the "Southern Dental Association, branch of the National Dental Association." A constitution to be adopted at a subsequent session.

The following officers of the branch were elected: Dr. E. P. Beadles, President, Danville, Va.; Dr. W. E. Walker, First Vice President, Pass Christian, Miss.; Dr. T. P. Hinman, Second Vice President, Atlanta, Ga.; Dr. F. P. Welch, Third Vice President, Pensacola, Fla.; Dr. B. D. Brabson, Treasurer, Knoxville, Tenn.; Dr. C. L. Alexander, Corresponding Secretary, Charlotte, N. C.; Dr. S. W. Foster, Recording Secretary, Atlanta, Ga.

Executive Committee: Dr. V. E. Turner, Ch., Raleigh, N. C., one year; S. B. Cook, Chattanooga, Tenn., one year; Dr. W. T. Arrington, Memphis, Tenn., two years; Dr. R. K. Luckie, Holly Springs, Miss., two years; Dr. W. R. Clifton, Waco, Tex., three years; Dr. H. E. Beach, Clarksville, Tenn., three years.

The Southern branch then adjourned to meet at St. Augustine, Fla., in 1898 at a time to be determined by the Executive Committee.

NEW TREATMENT OF SYPHILIS.

Quinine iodohydriodate $C_{20}H_{24}N_2O_2$. I. H. I. occurs as a brown powder, insoluble in water, but soluble in alcohol. This salt has been known for a long time, but the results recently obtained by Assaky (*Therap. Wochensh.*, IV., p. 279) in secondary and tertiary syphilitic affections have been so excellent as to warrant their mention. A daily dose of 2.5 gme. exerts a decidedly favorable effect on these affections, in so far as the local and general symptoms are caused to disappear in a comparatively short time. Iodism is never observed but at times quinism appears, particularly in patients specially subject to it. The remedy is prescribed in pill form, as follows:

Quinine iodohydriodate.....	10 gme.
Kaolin.....	2 gme.
Mucilage acacia.....	to make 80 pills.
Sprinkle with powdered talcum.	

Dose: Two pills every quarter of an hour in morning until from 16 to 20 pills have been taken.

ON THE COMBINED USE OF NARCOTICS AND HYPNOTICS.

In the *Dent. med. Woch.*, 1896, No. 37, Dr. Bresler, of Freiburg, insists that our knowledge of the numerous narcotics and hypnotics is not specific enough. As we know from embryological data, the different parts of the nervous systems are separate and have developed at different intervals, so it is true that drugs act upon the different parts of the nervous system with different intensities and at different rates; hence the need for a combination of quieting drugs. In anæmic or exhausted conditions he would combine wine or beer with opium or chloral; opium he believes to go well with trional or sulphonal; while chloral and paraldehyde combined are not as valuable as either drug alone.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

THE MEETINGS AT OLD POINT COMFORT.

The American Dental Association and the Southern Dental Association have passed out of existence and in their place has been organized the National Dental Association. For a number of years periodic unsuccessful efforts have been made to consummate what at last has been accomplished. It is to be hoped that all the late members of the disbanded organizations will give their support to the building up of the new organization.

The principal point of difference between the National and the late American lies herein, that the National must meet successively East, West and South, and under this rule, the next meeting will be held West, and Omaha has been selected.

There is also provision for the organization of a branch in each division. It is impossible to foresee the result of what was accomplished at Old Point; only time can determine how the matter will operate, but inasmuch as both associations had arrived at a stage when "something had to be done," the outcome could not be otherwise.

The scientific work accomplished was naturally meager; the oppressive heat and the work attendant upon the contemplated union making the reading of papers by title, very popular.

Before the opening of the meeting a serious rupture between the National Association of Dental Faculties and Dental Examiners was threatening, but that has been happily averted for the present. We shall watch the future with interest. Unfortunately the Association of Faculties has receded from the position on preliminary requirements assumed in 1896 and adopted what practically were the requirements in 1884.

It is not improbable, however, that a gradual raising of the standard from year to year will soon be put in operation.

The Association of Examiners has adopted very fair rules by which a gradual raising of the standard for preliminary education is secured and no doubt many of the schools now in operation already make their requirements voluntarily higher than that required by either body.

The Southern Dental Association accomplished less work than is usual and this was due to the discussions precipitated by the proposition to unite.

The National School of Dental Technics does not meet until December.

THE SCHOOL YEAR.

Shortly after this number of the DENTAL REVIEW reaches the reader the dental schools of this country will have opened their doors and several thousand new aspirants for professional honors will be at work trying and vying for place in the classes. It is to be hoped that all will enter upon their studies with the determination to acquire all that is worth remembering. In some conversations held with recent graduates we have learned that too many are imbued with the idea that fundamentals, or elementary scientific subjects are not eagerly sought after, more attention being paid to immediate longings for things belonging to practice. A love for the study of chemistry, anatomy, physiology or other first year studies is of prime importance to the student as the compact knowledge of such subjects will stand the pupil in good stead in the after hours of early or late practice. The mere technique of operations in operative or prosthetic dentistry will be gained with sufficient celerity after principles are thoroughly mastered.

We believe that we do not overstate the fact that many are good gold workers, but not artists. They do not have a cultivated judgment. If students would enter upon professional studies a little later in life than eighteen or nineteen years of age they would be more receptive and they would appreciate the necessity of acquiring a broad and exact knowledge of underlying principles. It is far better to devote one's self to two or three subjects and work at them than to dandle over four or five and acquire only a smattering, a quiz knowledge as it were.

If this should reach the eyes of many students we hope that

they will organize into small societies for the conjoint study of subjects in the curriculum of the respective years. Much can be done in this way by spending one or two evenings per week during the term, in the exercise of this sort of study, students should alternate in having a master for the evening. From our own experience in a small coterie of five or six, many difficult subjects were made plain and easily understood in student days.

WHAT CONSTITUTES OPERATIVE DENTISTRY.

One might at first glance say that all operations on the mouth or teeth would be covered by the term operative dentistry. Filling teeth and filling roots, scaling teeth, treating diseases of the gums—*pyorrhœa alveolaris*—treating irregularities of teeth, bleaching teeth, treating abscesses, extracting teeth, capping pulps, destroying pulps, etc., planting, replanting teeth, treatment of fractures of the maxilla, removal of small tumors, caries and necrosis of bone—do these operations come under the heading of operative dentistry? Is it proper to assume that deviations of the dental arcade and their correction constitutes a branch of operative dentistry. The extraction of teeth, operations for opening the antrum can hardly be called operative dentistry. Planting teeth may be considered a surgical operation, as also the treatment of fractures of the jaws.

From year to year small specialties are going out of the practice of dentistry and dental surgery. The treatment of palatal defects and crown and bridge work have gone from operative dentistry as well as orthodontia. We think the extraction of teeth and the planting of teeth will soon have to go. Soon we will have another specialty in the treatment of loose and loosening teeth, until finally operative dentistry will consist of treating diseases of the teeth and filling teeth. This will include bleaching teeth, filling roots, arresting toothache, cleansing teeth and minor treatments of local inflammation of the gums and the obtunding of sensitive dentine. Facial neuralgia and operations for its relief will join the other branches of dental surgery.

THE NATIONAL DENTAL ASSOCIATION.

From the ashes of the American Dental Association and the Southern Dental Association has arisen the National Dental Asso-

ciation which will hold its first meeting in Omaha next year. We note with gratification that the association meetings may be held at any time of the year instead of always the first of August. Our hope is that it will have the fullest support of all sections of the country.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

At the late meeting of the above association (incorporated) at Old Point Comfort, Va., Dr. Meeker, the Secretary, said: "The only ones I remember that absolutely refused to sign were the States of New York and Illinois. I sent four different communications to Illinois, to Dr. Harlan, and I changed the address each time, to the secretary and members of the board, and they all sent them back, but without the signature of the president and the secretary. I hear that Illinois has a new board now, and that Dr. Harlan is out."

When Dr. Harlan was president of the Illinois board he found that it was not the province of the board to join an incorporated body outside of the limits of Illinois, hence it was not possible to join the above association. The secretary was instructed to write and say so to the secretary of the National Association of Dental Examiners. The Illinois board assisted in the organization of the National Association, and held its membership in it as long as it was a voluntary association; but when it changed to an incorporated body it was held by its legal adviser to be contrary to the spirit of the law creating it to join such an association. The courts of this State have held that the board could not act upon the assumption that it received its orders to act upon the advice or direction of a body created outside the limits of the State. We believe that the association will have to disband and form a new voluntary organization again.

AMERICAN DENTAL ASSOCIATION—THURSDAY, AUGUST 5, EVENING SESSION.

CONCLUDED FROM PAGE 655. Reported by Louis Ottofy.

The Association reconvened at 8:15 P. M.

Authority was given to the publication committee to publish the transactions of the present meeting.

In view of the dissolution of the association it was ordered

that copies of the transactions of the association on hand shall be placed for safe keeping and preservation in care of the Army Medical Museum and Library in Washington. The old record book of the society was ordered rebound. A copy of the names of all who have been members of the society, with the date of their joining, was ordered made and also deposited in the same place.

It was carried that when the association adjourns to-morrow, it shall be forever.

All officers were authorized to act until their several duties have been discharged.

On motion, \$1.00 per capita of the active membership was ordered paid into the treasury of the National Dental Association. The Treasurer was authorized to pay all bills and to pay the remainder to the Dental Protective Association.

Dr. Wms. Donnally then read the report of the committee on Army Medical Museum and Library, which contained a resolution requesting the appointment of a scientific dentist in the department, at the expense of the government. The report was adopted.

Dr. Louis Ottofy, of Chicago, presented that portion of the report of section II. relating to Dental Education, and Dr. S. H. Guilford, of Philadelphia, presented that portion relating to Dental Literature and Nomenclature.

Dr. J. N. Crouse, of Chicago, then read a paper entitled "The Amalgam Question."

Adjourned.

FRIDAY, AUGUST 6, 1897.

The American Dental Association, as such, was called to order for the last time in its history by the President, Dr. James Truman, at 10 o'clock A. M.

It was ordered that in the printed transactions of the American Dental Association there shall be added a record relating to the dissolution of this body and the organization of the new association.

The present auditing committee was requested to continue its labors until the affairs of the association are finally settled, and to audit and publish their report, through the dental journals.

The paper read at the session last evening by Dr. Crouse on "Amalgam" was discussed by Drs. Patterson, Taft, Custer, Peirce, and closed by Dr. Crouse.

On motion, at the final adjournment, all permanent members

present were requested to sign their names in one of the books to be preserved with the archives.

The time for final adjournment having arrived, remarks appropriate to the occasion were made by Drs. J. Taft, Corydon, Palmer, James McManus, H. A. Smith, J. N. Crouse, C. N. Peirce, Thos. Fillebrown, J. D. Patterson, Geo. H. Cushing.

The thanks of the association were tendered to the officers of the association, and especially to Dr. Cushing, the secretary who has long and faithfully served the association.

Dr. James Truman, the president, then made some appropriate remarks regarding the dissolution of this association.

The association then adjourned for the last time in its history at 11:42 A. M.

The final roll was signed by thirty-one permanent members, the last names added being those of Drs. H. A. Smith and Jonathan Taft, of Cincinnati, Ohio, who were among the first to sign the constitution at the original organization.

The members then reluctantly disbanded and an important chapter in the history of American dentistry was closed.

REVIEWS AND ABSTRACTS.

SOME METHODS AND APPLIANCES IN OPERATIVE AND MECHANICAL DENTISTRY. Illustrated, pp. 120. By R. P. LENNOX, Cambridge, England. London: C. Ash & Sons, 1897.

This little volume was evidently written by one who was himself capable of doing everything described between the covers, and in a most clear and concise manner has he described all the techniques.

A beginner as well as an old practitioner will find methods simplified so that without any other guide he can do all the operations described. Most of the works on similar subjects are too bulky for immediate use; this is not, and we are pleased to commend it as being just what you wish on the operating table or the laboratory bench.

COMPEND OF DENTAL PATHOLOGY AND THERAPEUTICS. BY H. H. BURCHARD, M. D., D. D. S. Philadelphia: 1896. The S. S. White Dental Mfg. Co., 138 pages.

This is a student's note book, not a quiz compend. From a

somewhat careful examination we find nothing to criticise and much to commend. It is well adapted for work during the college term, and may be carried in the pocket.

The description of pathological lesions and the therapy will be found up to date, and will greatly aid the student in mastering principles. Works of this character are not too numerous and few are so concise or well written. Buy it.

THE AMERICAN TEXT-BOOK OF OPERATIVE DENTISTRY, IN CONTRIBUTION BY EMINENT AUTHORITIES. Edited by EDWARD C. KIRK, D. D. S., Professor of Clinical Dentistry in the University of Pennsylvania, Philadelphia; Editor of "*The Dental Cosmos*." 8vo, 702 pages, illustrated with 751 engravings. Published by Lea Brothers & Co., Philadelphia and New York, 1897. Price, \$5.50.

The following is a list of contributors to this new text-book : R. R. Andrews, Cambridge, Mass.; Henry H. Burchard, Philadelphia, Pa.; Calvin S. Case, Chicago; William E. Christensen, Philadelphia, Pa.; Dwight M. Clapp, Boston, Mass.; M. H. Cryer, Philadelphia, Pa.; Edwin T. Darby, Philadelphia, Pa.; C. L. Goddard, San Francisco, Cal.; S. H. Guilford, Philadelphia, Pa.; Louis Jack, Philadelphia, Pa.; Edward C. Kirk, Philadelphia, Pa.; Louis Ottofy, Chicago; C. N. Peirce, Philadelphia, Pa.; J. D. Thomas, Philadelphia, Pa.; Alton Howard Thompson, Topeka, Kan.

The work is intended as a companion to a similar book issued a year ago by the same publishers on prosthetic dentistry, and edited in a similar manner by Dr. C. J. Essig, of Philadelphia. The present volume is dedicated with the consent of the contributors to Dr. James Truman, of Philadelphia.

Since the issue of the first edition of "Harris' Principles and Practice," it has been the aim of writers to present to the student and practitioner in one, two or three volumes, all that is essential and practical for the successful pursuance of study and practice. The last notable work of this character was "The American Text-book of Dentistry" in three volumes, published under the editorship of Dr. Wilbur F. Litch. That so soon a more modern text-book should be in demand is an indication of the rapid progress made in dentistry.

The chapter on the anatomy of the teeth, by Dr. Thompson,

is presented in that usual forcible style of this careful investigator and writer, and presents the subject to the reader in as complete a manner as possible. The subject of embryology and histology, from the pen of Dr. Andrews, is no less perfect and complete.

The next eight chapters, written by Drs. Jack, Guilford and Darby, cover nearly the entire field of operative dentistry proper, and are up to date, concise and beyond criticism. Dr. Burchard furnishes a good chapter on plastic filling materials, Dr. Clapp on combination fillings and Dr. Christensen on inlays.

The field of operative dental surgery is then treated in a manner beyond criticism by Drs. Jack, Burchard, Peirce and Kirk.

The extraction of teeth and the administration of anæsthetics, local and general, receives complete consideration from the pens of Drs. Burchard, Thomas and Cryer. A chapter on "Plantation of Teeth," by Dr. Ottofy, is followed by a thorough résumé of the important subject of the "Management of Pulpless Teeth," from the pen of Dr. Goddard.

The next two chapters are strictly more appropriate to a work on prosthesis, but they are nevertheless a valuable contribution to this work. One is on "Orthodontia Considered as an Operative Procedure," by Dr. Goddard and the other on "The Development of Esthetic Facial Contours," by Dr. Case.

From the standpoint of either student or practitioner, this work deserves the highest commendation, and may be accepted as a valuable contribution to the permanent literature of dentistry.

The imprint of the noted firm of Lea Brothers & Co., make any reference to the excellent general make-up of the book, perfection regarding type, paper or binding, superfluous.

L. O.

A PRACTICAL TREATISE ON MECHANICAL DENTISTRY. BY JOSEPH RICHARDSON, M. D., D. D. S. Seventh edition, revised, enlarged and edited by GEORGE W. WARREN, D. D. S. With 691 illustrations, many of which are from new and original drawings. P. Blakiston, Son & Co., Publishers, Philadelphia: Price \$5.00, Cloth.

It is creditable alike to the publishers and editor of this standard volume that they have met the ever increasing demand for its use. The best criticism that can be offered in regard to it

is that this edition, like those that have previously been published, is better than the editions preceding it.

This work has been the recognized standard of authority on mechanical dentistry for the use of students and the young practitioner for many years. It has at no time failed to meet fully this reputation accorded to it by teachers and profession. The seventh edition is no exception. With its new, carefully written chapters and the elimination of those processes and methods that were once valuable but at this time useless, the high character of the work has been sustained.

The systematic methods have not been departed from, nor the careful attention to details have not been lost sight of in the effort to make the book useful as a text-book for students. The untried experiment of making a text-book for this purpose by the selection of a number of contributors to write it is a doubtful one. While it makes a work valuable as a book of reference, it does not meet as fully the necessities of a text-book for students' use. It becomes an epitome of the advanced thought and experience of specialists at the expense of the fundamental principles so essential for students and beginners.

The years 1896 and 1897 have added much to the literature of the dental profession, and the seventh edition of Richardson's *Mechanical Dentistry* will occupy its usual place as the standard work on the subject.

A. O. H.

DOMESTIC CORRESPONDENCE.

NEW YORK, August 26, 1897.

EDITOR DENTAL REVIEW,
Chicago, Ill.

Dear Sir:—Will you grant me a little space for a reply to the effusion by Dr. Geo. J. Friedrichs, which appears on page 657 of your August issue? It might seem like a wanton waste of good white paper and printer's ink if the object was merely to enlighten Dr. Friedrichs; but as his letter might lead others to accept as just, his little satirical attack on Dr. Herbst, I may be pardoned for this communication.

Your correspondent endeavors to poke fun at our magazine because in the department entitled "European Progress," we gave

place to an article on "Submarine Gold," by Dr. Herbst, whose name, by the way, he does not mention, not realizing perhaps that Dr. Herbst is quite as well known to the dental profession as is Dr. Geo. J. Friedrichs. He points out that some twenty-nine years ago a few fillings were inserted under conditions which made it impossible to exclude moisture, and which nevertheless did good service, and then he asks, "Where is the progress or novelty" in Dr. Herbst's method?

This almost makes one wonder whether he read Dr. Herbst's article beyond the first paragraph, which he quotes, because in the second paragraph Dr. Herbst describes a special kind of gold which he uses in his submarine work; and while it may be true that some gold fillings have been made in the past which have not failed, although inserted in the presence of moisture, it certainly is new that there is now on the market a kind of gold which is manufactured expressly and solely for use under water.

Dr. Friedrichs could not have read as far as the third paragraph on page 380, where Dr. Herbst explains that "the gold is preferably kept on a wooden plate and moistened with water, which makes the manipulation easier." Perhaps this method of using gold, purposely wetting it, is no novelty to Dr. Friedrichs, but if he has known of it he has kept the secret safely locked within his own bosom, or at least any publication of this method by him, or any other one, in the literature of this country has escaped the notice of

Very truly yours,

R. OTTOLENGUI.

REPLY.

EDITOR DENTAL REVIEW,

Chicago, Ill.

Dear Sir:—I regret that my "effusion" in your August number should have occasioned so much heat. If the intention was to have been satirical or funny, I certainly was unconscious of my peculiar powers in these directions, and must confess that, after having been enlightened, I still am so dense that I fail to extract either the one or the other out of the whole article, and believe that no reasonable man can.

As the article by Wm. Herbst, D. D. S., Berlin, Germany, in the *Items of Interest* was entitled "Submarine Fillings," I really believed he was writing upon that subject, and not upon any par-

ticular kind of gold; and after rereading it I am convinced he so intended, as the gold he describes has the same properties, and is in no way different from any other chemically pure gold. "The gold which can be used under moisture is a chemically pure foil, very soft and of the thickness of the ordinary No. 60 foil, but without the unyielding and stiff properties usually found in foils of that thickness. This gold is entirely noncohesive when not annealed." This is the only description of the "kind of gold" given in the entire article. Abbey's and other foils possess these qualities, and have been in use for over forty years. I therefore fail to see any progress in the use of this kind of gold, either European or otherwise.

I also believe that I have the right, without incurring the penalty of any one's ill-tempered abuse, to criticise the broad statement that, "It is new that we may use gold for filling teeth, admitting moisture, and obtain perfect results."

To deny this statement was my whole intention, and I never thought to, nor did I discuss, the special method of Dr. Herbst, though I fail to see the merit of purposely wetting the gold, when there is already sufficient moisture in the mouth to contend with.

Submarine fillings have been and are successfully inserted from the days of Dr. Chapin A. Harris to the present time. That I did not "safely lock the secret in my bosom" is proven by the fact that I read an article relating to the subject before the American Dental Association in 1878 and published in their transactions. Indeed, it was so old then that I did not claim it as a novelty. It is certainly unfair to hold me responsible for Dr. Ottolengui's ignorance of the matter.

Instead of having read "only as far as the third paragraph on page 380" I have carefully read the article three times and find the words "submarine gold" occur just three times and always in connection with the method of manipulating it, and for one am unable to infer that it was absolutely necessary to have "submarine gold" in order to insert a filling, or that the article was on the market for sale. If there is a such an article on the market "manufactured expressly and solely for use under water," I can find no mention of it in the article as published.

Indeed, the only submarine gold I ever heard of was prepared by Dr. Lamm, a dentist of the city of New Orleans (there universally known as the inventor of "Lamm's Fireless Engine"). Under the

caption of "Crystal Gold, Warranted to Pack Under Moisture," it was offered to me and to others, in the early sixties, but as it never came into vogue, I concluded it went the way of many another dental novelty.

The following facts can be demonstrated:

1. All cavities that can be filled with soft foil can be filled with gold, whether that gold is absolutely chemically pure or not.

2. Gold foil, when made into cylinders, can be inserted under moisture with as much facility as gold in any other shape whether wet or dry; and this has been done for the last forty years by myself and others, who make use of hand made cylinders for filling teeth.

Now, if with ordinary gold foil, submarine fillings can be and have been inserted, Charles Abbey & Son's and other manufacturers of gold foil must have been turning out "submarine gold" without their knowledge.

The method described by Dr. Herbst for the inserting of "submarine gold," is the wedging system, which is also the basis of cylinder filling and by which title both might be more properly designated. It is as "old as the hills."

In my own behalf I desire to state that my "effusion" was neither offensive, personal, satirical nor funny, and my failure to mention Dr. Herbst's name was not due to a want of a realizing sense that he was "quite as well known to the dental profession" as myself. I considered it unnecessary, and for him I have sentiments of high respect. The subject is an important one to the profession and should be dispassionately discussed. Those who know me, know that I would not wantonly offend any one, and if I should inadvertently do so, I would always stand ready to render any satisfaction the occasion demanded. I believe that in matters of this kind the amenities that prevail among gentlemen should be preserved, and any further references of that character will be treated with the silent contempt they deserve.

GEO. J. FRIEDRICHS.

PRACTICAL NOTES.

SOME MISTAKES IN CROWN AND BRIDGE WORK.*

BY B. D. WIKOFF, D. D. S., CHICAGO, ILL.

When I was approached to read a paper before this society, the subject of mistakes in crown and bridge work came to me and the numberless errors that had come under my own observation in the few years of my practice led me to choose this subject.

There has been a great stride forward in crown and bridge work in the past few years and a great deal of the work is successful, but, I am sorry to say, we all make mistakes and some very serious ones.

Dr. Cigrand, in discussing Dr. Black's paper on "Recent Improvements in Filling Teeth," read at the thirty-third anniversary of the Chicago Dental Society, stated that it had been his sad experience to wear a gold crown for a number of years; that on account of its not being properly contoured to preserve the interproximate space had caused him more trouble than the rest of his natural teeth, and that he had gone to a number of the most prominent dentists in the city and that none of them could tell him the cause of the trouble and the remedy.

This is one of the most common errors that is made and is the cause of great inconvenience to the patient. It is always best to contour the crown as nearly natural as possible, and if there is much space on each side of the root exaggerate the contour so as to fill it at the occlusal surface.

Another common error is to crown a tooth with a living pulp. In the first place a tooth with a living pulp cannot be properly trimmed so as to make the crown fit at the gum line where it should fit, without greatly torturing your patient, and after the work is finished it is only a question of a short time until the pulp dies, then the crown must be removed and repairs made, which is a great deal more work than to destroy the pulp in the first place and fill the root and avoid all this trouble. Then you can trim the tooth so as to make the crown fit.

Another very great and common mistake is to put an all gold crown on any of the eight anterior teeth for a lady, but for a man it does not matter so much, for his mustache will hide it. I cer-

*Read before the Odontographic Society of Chicago

tainly do not think a truly professional dentist would put a golden crown on any of the anterior teeth of a nice young lady, but they are seen on the streets every day, and as far as you can see them they look like the gilded signs of the duck dental parlors. It should be considered a violation of the code of ethics for a member of any of our dental societies to do such a thing.

We sometimes err and crown roots that are loose and badly decayed and expect them to stand and be of service. They may last for a time but cannot be permanent.

Again we sometimes try to have one tooth do the work of two or more, which is very apt to get us into trouble if we do not have some support at the other end. You have probably all seen the ill effects of making a large bridge with one or both ends unsupported, save as it rests on the gum, which must give way in time and cause the failure of the bridge.

Another and quite common and sometimes quite serious mistake is to not have sufficient solder or thickness of gold where the dummies join the pier of a long bridge. It has been my sad experience to be compelled to remove several bridges to repair a break at this point. There is a great strain on a long bridge from mastication and the dummies and piers must be well and thoroughly united to give sufficient strength.

Another error is to use gold of too light a gauge and without reënforcing the cusps in some way and to use too low a karat of solder because you are more apt to burn the gold.

There is no necessity of soldering facings in crown or bridge work. They can be riveted and in that way avoid heating and checking the facings. Then the color can be changed by using various colored cements back of them.

In porcelain work we should never allow any of the porcelain to extend over the band, as the film of porcelain is apt to check and pull off and spoils the looks of the work.

It is a mistake to put on a Logan crown or any crown without a band or part of a band unless the root is unusually strong, as there is great danger of splitting the root.

In taking an impression and bite for a crown it is unnecessary to take them separate and is more reliable to use nothing but plaster. After the band is in place mix the plaster as for an impression, then take a little on the end of the mixing spatula and plaster it over the band and adjoining teeth, then have the patient

close the teeth and hold firm until the plaster sets, then you have both impression and bite which can be varnished and placed in an articulating frame as any other bite.

PULP EXTIRPATION.

TORONTO, August 20, 1897.

EDITOR OF THE DENTAL REVIEW:

Dear Sir:—You publish a letter from my old friend, Dr. Griswold, of Denver, re pyrozone 3 per cent for extraction and the extirpation of pulps. Allow me to say that I think I take precedence in the use of this method. Three years ago I gave my formula to Dr. C. N. Johnson, of Chicago, also to Dr. Watkins, of New Jersey. The formula was also published in the *Dominion Dental Journal*, of Canada, about the same time. Two years ago I went to the New Jersey State Dental Society meeting for the purpose of giving a clinic with this preparation; but a subject not being furnished me, failed to do so. I make use of it constantly in getting rid of pulps in crowning, etc.

A compress placed upon the needle of the syringe extending up to the part, injecting the pulp with the solution, renders the extraction of it absolutely painless. Immediate root filling after this process can be accomplished. In the extraction of teeth the injection I find is rather painful in most cases, but if properly done extraction is painless.

My formula:

Pyrozone, 3 per cent	}aa ʒss.
Aqua distilat		
Olea cassia	}aa ℥iii.
Acid carbol		

I do not know that the cassia and carbolic acid assist in the effect, but at the time I discovered the obtunding effect of the mixture I was washing out a pyorrhœa pocket, and had mixed the three together, when the use of it whitened the gum and rendered it absolutely insensible; hence the addition of the cassia and carbolic acid.

Very respectfully yours,

CHAS. P. LENNOX.

MEMORANDA.

Do you use formalin ?

Dr. F. W. Huxmann has returned from Europe.

Northern Illinois Dental Society October 20, 21, Rockford.

Dr. N. S. Hoff was one of the essayists at the Minnesota meeting.

Dr. F. N. Houston is in Alaska practicing dentistry and prospecting.

Dr. E. C. French, of Eau Claire, Wis., was at the Minnesota meeting.

Dr. Wm. Taft, of Cincinnati, spent a few days in Chicago in September.

Dr. John H. Spaulding, of Paris, France, is visiting friends in the Northwest.

Dr. Geo. T. Carpenter is the new dean of the Columbian Dental College of Chicago.

Dr. G. W. Cook is to be the oral surgeon for the Northwestern College of Dental Surgery this winter.

Dr. E. J. Perry will hold the chair of Prosthetic dentistry in the Chicago College of Dental Surgery the coming session.

Nearly all of the city dentists have returned from their summer outings and are hard at work, with renewed vigor and earnestness.

Dr. G. V. Black will devote all his time to teaching and experimenting in the Northwestern University Dental School the coming winter.

Received the "Injuries and Surgical Diseases of the Face, Mouth and Jaws," by John S. Marshall, M. D., too late for notice this month.

Everytime you see the sign "dental college" on a window in Chicago you must not think it is a real college, some are such only in name.

Dr. W. W. Walker will return from Europe the last of September, with more novelties for New York and the various societies of which he is a member.

The dentists of Omaha are already at work to boom the meeting of the new National Dental Association. It is expected that at least 600 will be present.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting will be held at Springfield, Ill., September 28, 1897.

Dr. H. W. Shriver, of Omaha, paid a flying visit to Chicago in August. He says that Omaha will be the ideal place for the next meeting of the National Dental Association in 1898.

The Thirteenth International Medical Congress will be held in Paris in 1900. The exact date has not been fixed but it will be during the summer—probably in August. A dental congress will also be held in Paris in 1900.

Dr. Thos. W. Evans, of Paris, France, is visiting in this country in company with Dr. Edward Crane. Dr. Evans has resided in Paris for fifty years and he comes over on the sad errand of bringing the remains of his wife for interment in her native land.

NOTICE.

The Northern Illinois Dental Society meets in Rockford, October 20 and 21, 1897. A good program is in course of preparation.

JAMES W. CORMANY, *Secretary*.

Dr. D. W. Clancey, of Cincinnati, spent a few days at French Lick Springs, Ind., in August recuperating. Many need the invigorating waters and baths at French Lick or West Baden Springs. The "Monon Route" from Chicago, Louisville and Indianapolis will carry you there safely and comfortably. The hotels are good and the surroundings are pleasant to look upon.

SULPHUR FOR MOUNTING CARBORUNDUM WHEELS.

Powdered sulphur, such as is generally used for fixing tube teeth in position, is superior to shellac for mounting carborundum wheels on lathe chucks.

To mount a wheel, heat it and the chuck over a Bunsen flame, put sulphur in the hole of the wheel, fit the chuck on the lathe head true the wheel, while the chuck is warm, secure the wheel in position by tightening the nut against it, hasten the setting of the sulphur by pouring cold water over the wheel and chuck, and the result will be perfect fixture of the wheel on the chuck.

Dr. A. W. HARLAN: I obtained three roots of a molar tooth which Dr. J. H. Woolley filled in the mouth some eight years ago. This tooth had to be taken out on account of the roots separating. I cut them down and found that all of them were filled to the apex, and I want the permission of the society to report these root fillings in a forthcoming number of the DENTAL REVIEW, in order to show that dentists do fill teeth in the mouth just as well as they do in plaster of paris and paraffin. These roots were not considered large ones, indeed they were minute root canals with the exception of the lingual root.—*Chicago Dental Society.*

A COMPLIMENTARY DINNER WAS GIVEN BY THE ODONTOLOGICAL SOCIETY, LOUISVILLE, KY., SEPTEMBER 11, 1897.

Post-prandial—"Let your speech be always with grace, seasoned with salt." Subject for discussion—"How to Make Local Dental Societies Successful." introduced by Dr. Howard Van Antwerp, Mt Sterling, Ky. Discussion opened by Dr. C. G. Edwards, Louisville. Responses to toasts. *Conversazione*. "There is nothing either good or bad, but thinking makes it so"—*Shakespeare*. The following members were present. C. R. Shacklette, President; A. B. Weaver, Vice President; J. W. Clark, Secretary-Treasurer; J. H. Blair, W. E. Grant, M. M. Eble, Ed. M. Kettig, H. B. Tileston, P. R. Feigel, and invited guests.

NORTHERN ILLINOIS DENTAL SOCIETY, ROCKFORD, OCTOBER 20, 21, 1897—PARTIAL PROGRAM.

The following papers and clinics have been promised.

PAPERS.

- 1 President's Annual Address, by Dr. E. H. Allen, Freeport
- 2 "Possibilities of Prosthetic Dentistry," by Dr. E. J. Perry, Chicago.
- 3 "Correct Positions at the Dental Chair," by Dr. C. W. Cox, Batavia.
- 4 "Preparation of Cavities," by Dr. M. L. Hanaford, Rockford.
- 5 "Shaping and Improving the Appearance of Natural Teeth by the Wheel," by Dr. M. A. Webb, Chicago.

CLINICS.

1. Surgical cases.
 2. "Treatment of Pyorrhœa Alveolaris," by Dr. C. P. Pruyn, Chicago
 3. "Tin and Gold Cylinder Filling," by Dr. T. W. Beckwith, Sterling
 4. "Surgical Clinic," by Dr. T. W. Brophy, Chicago.
- Members of the Northern Illinois Dental Society who desire to give Clinics should promptly notify

LOUIS OTTOFY,

Chairman Executive Committee, Masonic Temple, Chicago.

Under the head of "Incidents of Office Practice," Dr. J. N. Crouse made the following remarks: I have here a specimen which was sent to me by a gentleman in Minnesota, and it illustrates very well the abuse to which nature's tissues will sometimes submit. The case was that of a boy seven years of age, who was sent to him with toothache, it being the first six-year molar. He found extreme pulpitis, and made an application first to relieve the inflammation and then the next day applied arsenic. Following that he removed the pulp and filled the roots. Five years after, the boy came to me with a swollen face, and finding that the tooth troubled him, I extracted it. After this, he took a hammer and broke the tooth square through the two roots. There was a gutta-percha point in one canal, and the other had nothing in it except a live pulp in the front root, which had remained so for seven years after having been filled with gutta-percha. The distal root showed by careful observation that the tooth had not perfected its growth. The specimen is a rare one, and he wishes to have it placed in a museum, after publishing a report of the case. I would be glad to have any one make some remarks in reference to this case. You can easily see the living pulp in front of the root with the gutta-percha point going down one canal, and the pulp which was alive in the other was extracted.—*Chicago Dental Society.*

THE DENTAL ASSOCIATION—COMPLIMENTARY DINNER TO DR. ALFRED BURNE.

The Council of the Dental Association of New South Wales tendered to their President (Dr. A. Burne) a complimentary banquet on Thursday evening in honor of his long Presidency of the association, and to mark their appreciation of his courtesy during the five years' term of his office. A large number sat down to an excellent dinner.

Mr. H. Paterson (Vice President) presided, having on his right hand the guest of the evening, and on his left Mr. W. J. Trickett, M.L.C. Amongst others present were Dr. Knaggs, Dr. O'Reilly, and Dr. James Graham, M. P., representing the medical profession; Mr. S. Chaim (Vice President), Mr. John Haynes, M. P., Dr. Oscar Davis (Hon. Treasurer), Mr. C. C. Marshall, Mr. H. S. Newton, Mr. J. S. Darton, Mr. E. A. Gabriel, Mr. F. G. Hollway, Mr. H. Taylor (Hon. Secretary), and others. Dr. MacLaurin wrote apologizing for nonattendance and speaking in high terms of Dr. Burne.

The Chairman, in proposing the health of the guest, said that the gathering present might be taken as representing both the medical and dental professions of New South Wales. They were there to do honor to a man to whom such an honor was eminently due. The Dental Association had been working for the past five years in striving to get a bill through Parliament, and, now that their labors were nearly ended, no man had more right to accept thanks than Dr. Burne. The Chairman then traversed the five years' work done from the date of the first meeting, held on April 5, 1892, up to the present time. The progress of the bill, the many difficulties to be met, and the opposition from outside sources rendered the position of President a hard one to fill, but under Dr. Burne's presidency, all difficulties had been met, and the entire thanks of the dental profession were due to him.

Dr. Burne, who was cordially received, tendered the company his sincere thanks for the friendliness they displayed toward him, not only then but on former occasions. He gave a brief résumé of his presidency, and of the work of the officers, who had been with him during his term of office. He felt sure that as long as he held the presidency that good feeling would still continue. He referred to the medical dinner lately held in Sydney, at which reference was made to the medical congress to be held in Brisbane during the coming year. A dental section was to be included, and he felt that as president of the association, he should thank the medical gentlemen present for their loyal support to the dental profession generally. He was sure that the good to be derived from the joining of hands of both professions must result in benefit to the public. If time would have permitted him, he would have represented the dentists on this side of the water at the dental Congress now being held in San Francisco, but unfortunately he was unable to go. He drew attention to the great benefit to be derived from the dental bill, now in the lower house, and felt certain that Dr. Graham, who has charge of the measure, would push the bill along, and thus bring about a result for the public good.

Mr. S. Chaim proposed "The Visitors," and particularly thanked Mr. Trickett for the manner in which he got the bill through the upper house.

Mr. Trickett, in responding to the toast, spoke of the necessity of both a medical and dental bill, for he felt that both the professions required to be under a certain amount of examination, both bills being of a social and domestic character, and both had his entire support.

Dr. Graham, in speaking to the toast, referred in kindly terms to Dr. Burne and the dental profession generally. He explained the reason that until the present he had been unable to bring the bill before the house, but trusted in a few days to be able to report progress. Owing to the long federation debate it had been impossible to introduce bills of a private nature, and opposition was caused through members objecting to class legislation, but he personally thought that the public would benefit to a greater extent than the dentist.

Mr. Haynes, Dr. Knaggs and Dr. O'Reilly also spoke.

Mr. F. G. Hollway proposed "The Ladies," Mr. H. S. Newton responding; Dr. Oscar Davis proposed "The Hon. Secretary," Mr. H. Taylor responding; and Dr. Burne proposed "The Chairman."—*Sydney Paper*.

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No. 10

ORIGINAL COMMUNICATIONS.

PRINCIPLES OF FORCE AND ANCHORAGE IN THE MOVEMENT OF
TEETH.*

BY C. S. CASE, D. D. S., M. D., CHICAGO, ILL.

If there is one thing more important than another in the science of regulating teeth, it is a mind that is well trained in the simple laws of physics, with the ability to practically apply these laws to the invention, construction and management of regulating appliances.

In the voluminous literature and teachings upon the subject of orthodontia and dentistry in general, there is little to be learned of these most important basic principles. In our endeavor to become a great profession and completely disassociate ourselves as professional men from the fearful calamity of being classed as tradesmen and mechanics, there has been an unfortunate tendency to underrate the value of certain branches of knowledge that lie at the very foundation of dentistry, and which should form the only true basis to scientific training for almost everything we undertake as dentists.

In contradistinction to the course commonly pursued by most teachers in the department of orthodontia, I occupy no time in lengthy histories of cases in practice because I believe it to be far more important to train the minds of students: First, in certain broad and general principles relative to artistic and harmonious relations that will apply to all cases. Second, in the scientific application of force for every variety of movement of a tooth in any position; which will equip him from a mechanical stand-

*Read before the Illinois State Dental Society

point for the movement of teeth, and finally for the complete management of the most difficult cases of irregularity. Certainly, this is the only true and scientific foundation for that display of individual thought and ingenuity which almost every case commands. He is now, if ever, able to invent something that will be applicable to the particular case in hand and which may differ in certain particulars from anything that has ever been used or ever can be used again. Furthermore, if correct artistic, physiological and mechanical principles are employed for the regulation of teeth, results are quite as reliable as most things in exact sciences, and therefore teaching along this line does not necessarily require to be founded on the experiences of practice.

In my teaching I dwell at considerable length upon the laws which govern the activities of force and the mechanical advantages of different methods of applying it in the practical movement of teeth. I treat a regulating apparatus together with the teeth to which it is attached, as a machine. The best definition of a machine is that it is an instrument interposed between a moving power and a resistance or work, with the view of changing the direction of force or otherwise modifying it.

The important difference between an ordinary and a regulating machine is, with the former power and work are the only important factors. A manufacturer, or person engaged in the use of machinery, is interested as to how much wood or coal, through the medium of its product steam or electricity, will produce a certain result in the form of work ; means for taking care of the force of reaction is amply provided for in the substructure or the inertia of the machine itself. Whereas with a dental regulating machine, power supplied by the operation counts for naught, while the factor, reaction on fulcrum and anchorage, referred to in Newton's Third Law of Force, is of the most vital importance. This law is : " To every action there is an equal and contrary reaction." And this equal and contrary force of reaction, which of necessity is sustained by other vital tissues, should be neutralized, either by reciprocatory action upon other irregular teeth that require movement in an opposite direction, or by so distributing this force through the medium of a static anchorage that it will do the least harm to teeth in proper position.

I said that I considered the teeth grasped by a regulating apparatus as a part of the machine itself—as levers, if you please,

doing work principally upon the bony structure surrounding their roots.

The ordinary lever is a rigid bar or inflexible rod resting upon a fixed prop called the fulcrum and having power and weight disposed at some two other points. The different ways in which the three factors, power, weight and fulcrum, can be disposed, gives rise to three kinds of levers. (See Fig. 1.)

Here again, as with machines in general, physics in computing quantities deals only with power and weight or work, exemplified, in the one general law of levers, i. e., "Power and weight are in

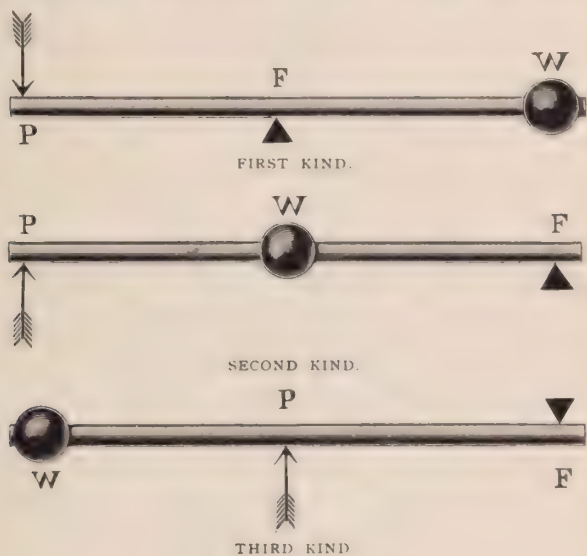


FIG. 1. LEVERS

the inverse ratios to their distance from the fulcrum." Nothing is said of the force of reaction or the force sustained at the fulcrum; whereas with a tooth considered as a lever the action at fulcrum, as will be shown, is quite as important to us at the points known as power and weight; and, moreover, it is important to keep in mind approximately the relation which it bears to these factors.

While it is never possible or necessary to accurately calculate these quantities, still in order to arrive at the rough estimate desirable, a clear conception of the mathematical methods employed under the laws of physics, especially those relating to levers, is

very important. This can easily be approximated with levers when we remember that the force exerted or sustained by that factor situated between the other two—at equilibrium—is equal to the sum of the other two, be it power, weight, or fulcrum. That is why a lever of the second kind is always chosen where great force is required at the expense of motion. Again, in the typical lever the fulcrum is always considered a fixed point, but we are aware that there are a number of implements employed in mechanics that exert force according to the principles of levers, though in

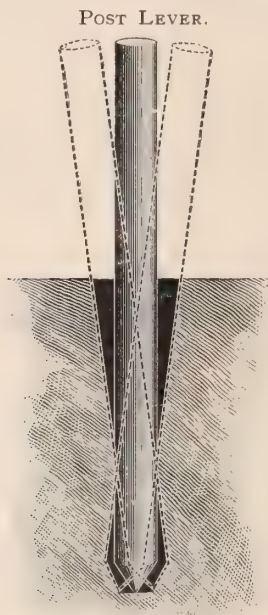


FIG. 2.

construction they differ in certain particulars from every one of the three kinds. Common examples of this are all forms of the “pulley, the wheel and axle powers.” There is, furthermore, a not uncommon kind of lever in which points of weight and fulcrum, in their activities upon each other, are more or less interchangeable—both acting as a fulcrum for the other, with varying stability and relative energy governed by the velocity of the moving power and the relative length of the power arm. An example of a lever of this kind is an oar of a row boat. In proportion to the velocity of the moving power exerted by the rower, above the possibilities

of the water to get out of the way of the blade, the oar becomes a lever of the second kind and the boat or work moves forward. But if the velocity of the moving power is not sufficient to overcome the inertia of the boat, the only work that the oar or lever can be said to accomplish is the movement of the yielding water in front of the blade, with fulcrum at the oar lock—or the action of a lever of the first kind.

If at any time you should drive a four foot post one-half its length into clayey soil of uniform quality, and then take hold of the top of the post and move it back and forth with a view of pulling it out of the ground, you would be working a lever which combines the qualities of the first and second kinds, or one like the oar in which the so-called areas of power and weight act as fulcrums to the other. (See Fig. 2). After pulling the post out of the ground, if it were possible for you to make a transverse section of the soil for the purpose of examining the shape of the hole you had made, you would find the upper two-thirds a V-shaped opening tapered down to the diameter of the post; the lower third spreading out to an inverted V. As the post was forced in one direction the soil in front of it along the surface area would become impacted or thrust to one side, the whole acting as a lever of the second kind with fulcrum at the lower end. At some point along its length, however, it would cease to move in the direction of the applied power—the very resistance of the soil over the surface area of work, causing it in turn to act as a fulcrum and the whole as a lever of the first kind with work or movement at the lower end in the opposite direction.

The reason that the upper area of work is twice that of the lower may be found in an examination of laws which refer to the relation of the three factors of levers. Considered as a lever of the first kind, if the fulcrum or surface area of the ground is exactly in the center of the post, the force exerted upon it would be equal to the sum of power and weight, or twice as great as that exerted at the lower end or area of work. Again, when considered as a lever of the second kind—weight or work now being between and at an equal distance from power and fulcrum—it would be forced to receive a pressure equal to the sum of power and fulcrum or twice as great as that exerted at the lower end or fulcrum area.

I am in the habit of illustrating these important principles to my students by examples of some simple forms of levers of the

first and second kinds. The beam of balance scales is a lever of the first kind. The support or central standard is the fulcrum, with points of power and weight at the end attachments for the pans. (See Fig. 3.) It can now be seen at once that when the beam or lever is at equilibrium the fulcrum sustains the sum of power and weight, and this would hold true of any lever of the first kind at whatever intermediate point between power and weight the fulcrum is placed. When the fulcrum is exactly in the middle of the lever, as with the example of the post lever, the fulcrum receives twice as much force as is exerted at weight and consequently the post would move through the soil at the surface of the ground twice as far as at the lower end in the opposite direction.

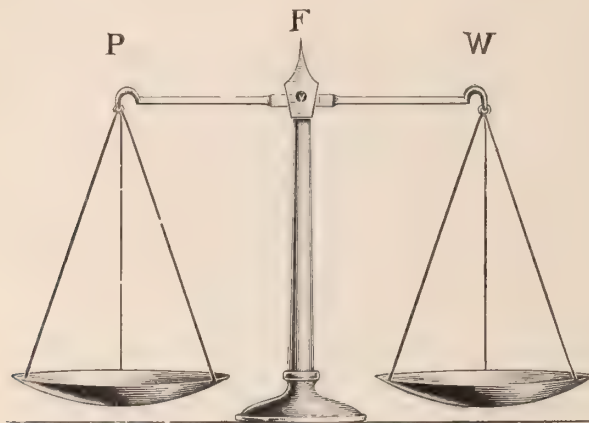


FIG. 3.

An example of a lever of the second kind may be a rod or pole supporting a weight carried by two men. (See Fig. 4.) If the points at which the two men—whom we may call P. and W.—grasp the pole are four feet apart, and the weight is a pail of water weighing thirty pounds swung in the center of the pole, each man would exert a force equal to fifteen pounds. In other words, the force exerted at W. exactly in the middle of a lever at equilibrium would be twice that at the fulcrum. Here, again, we have the same result as that shown by the action of a lever of the first kind.

Now, if you please, note the change in the relative magnitude of force exerted at fulcrum and weight when the length of the power arm is shortened. (See Fig. 5.) If P, grasps the rod one foot

from the pail, we have a three-foot lever with P. exerting twice as much force as F., which may be proven by the rule of levers, i. e., "Power and weight are in the inverse ratios to their distance from fulcrum."

Power arm of the above lever—3 feet—is to W. arm—2 feet—as weight—30 pounds—is to P. or 20 pounds, which leaves 10 pounds to be sustained by F. Therefore, the force exerted at weight in this lever is three times that at the fulcrum.

LEVERS OF THE SECOND KIND

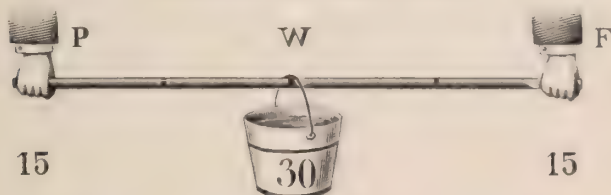


FIG. 4.

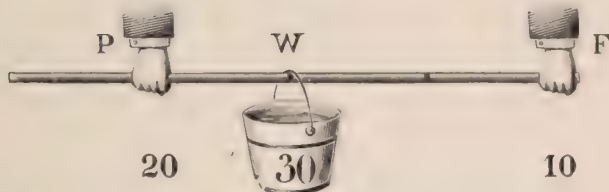


FIG. 5.

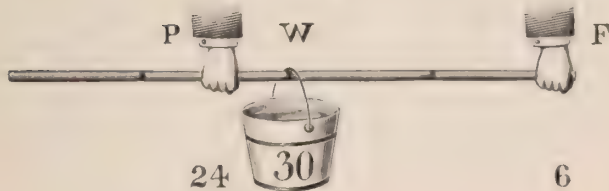


FIG. 6.

Again, if P. grasps the rod six inches from the weight, he exerts a force equal to four times that of F.—determined by the same law. (See Fig. 6.) Here the force exerted at weight is five times that at the fulcrum.

When we apply these rules to our post lever (which I have chosen to illustrate on a large scale the action of the same character of force applied to a tooth) we can see that the inverted V-shaped opening caused by the lower end of the post moving in

the opposite direction from the applied power may be changed quite decidedly in area by applying the power at different points along that portion of the post above the surface. For instance, when power is applied at the top of a four-foot post imbedded one-half its length in the ground, the movement at the lower end in the opposite direction will be one-half that at the surface of the ground in the direction of the power. When power is applied one foot from the ground, or at a point one-half the length of the exposed end, the movement at the lower end will be one-third that at the surface, and when applied six inches from the ground (or as near to the alveolar margin of a tooth as the gum will permit) the movement at the lower end will be one-fifth that at the surface. While teeth differ in shape from each other and from the post lever I have described, and while their alveolar surroundings do not present a uniformity of resistance to their movement, and therefore while we cannot calculate force and motion with mathematical accuracy, still the fact that they are imbedded one-half their length in a yielding substance and subject to the frequent application of force for the correction of irregularities, the only way by which we can approach an exact science in the application of power for their movement is to consider them as levers propelled by a machine doing work on the tissues in which they are imbedded.

When power is applied at one point to the crown of a tooth at right angles to its long axis, it becomes a lever with combined qualities of the first and second kinds. It is one more than the other in proportion to the relative difference in the resistance between cervical and apical portions. And while the relative proportion of movement at these points will be governed largely by the stability of their bony surroundings, it may be influenced considerably—as with the post lever—by the position upon the crown at which power is applied. For instance, in the construction of an appliance for the retrusion or retraction of the incisors with a traction wire extending from molar anchorages, if we wish the least movement possible of the roots in the opposite direction, the wire should rest upon the incisors as near to the gingival margins as the gums will permit. I usually solder to the bands upright bars which extend to the highest points of the exposed faces of the crowns. Grooves or rests are cut at the upper ends of these for the wire, enabling it to span the interproximate gingivæ. (See Figs. 7 8.) I frequently extend these bars above the

gum margins, as shown in Figs. 9 10, in order to apply power that is equivalent to direct force upon the roots at points above the margins of the alveoli, and I find these procedures of the greatest importance in arriving at results for which they are designed.

It is not necessary for me at this time to multiply descriptions



FIG. 7.

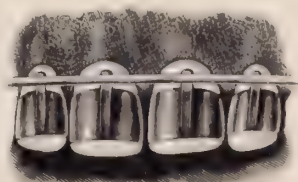


FIG. 8.

of methods relative to other teeth and conditions where this important principle may be employed, further than to say, that whenever it is desired to avoid producing an abnormal inclination of the crowns of teeth in the direction of the applied power, it is important and nearly always possible to take advantage of this or



FIG. 9.



FIG. 10.

some other equally effective mechanical principle. On the other hand, whenever in the movement of a crown under the application of a single force it is desired to move the root in the opposite direction, the force should be applied as near as possible to the occluding border. This is especially applicable in those very common cases of protruded crowns of the superior incisors, with a retrusion of the roots; the teeth often assuming a decided labial inclination with the production of a depression along the superior portion of the upper lip.

A tooth becomes a lever of the third kind when the power is applied at or near the cervix with the establishment of a mechanical fulcrum near the occlusal portion of crown, forcing work or movement of the entire root in the direction of the applied power. (See Fig. 13.) This is one of the most important and practical principles in dental and facial orthopedia and one, moreover, to which I am indebted for nearly everything I have accomplished in the development of æsthetic facial contours. Instances where this principle may be used to advantage are almost limitless, either in the form of two forces exerting a regulated power in opposite directions for the purpose of tipping the root in its socket, or as power restrained by an independent fulcrum with the view of moving the entire root in one direction.

In a paper presented at the Tri-State dental meeting at Detroit, in 1895, I gave the following explanation :

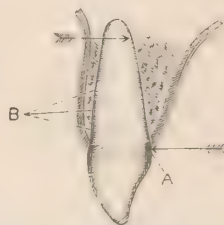


FIG. 11.

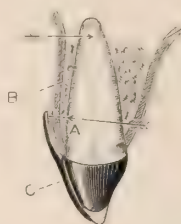


FIG. 12.

"The limited area upon which force can be applied to a tooth compared to that portion covered by the gum and imbedded in a bony socket, has made it next to impossible with all ordinary methods, to move the apex of the root in the direction of the applied power; nor could this ever be accomplished with force exerted in the usual way at one point upon the crown, however near the margin of the gums it be applied, for the opposing margin of the alveolar socket must receive the magnitude of this direct force, and in proportion to its resistance it will become a fulcrum exerting a tendency to move the apex of the root in the opposite direction."

But if in the construction of the apparatus a static fulcrum is created independent of the alveolus at a point near the occluding portion of the crown while the power is applied at a point as far upon the root as the mechanical and other opportunities of the

case will permit, the apparatus becomes a lever of the third kind, the power being directed to a movement of the entire root in the direction of the applied force.

This proposition is made plain by reference to the diagrams. In Fig. 11 let A be a point upon a central incisor at which force is applied in the direction indicated by the arrow, then will the opposing wall B of the alveolar socket near its margin receive nearly all of the direct force; and in proportion to its resistance will there be a tendency to move the root in the opposite direction. This proposition will also hold good even if we apply the force at A, Fig. 12, or as far upon the root as may be permitted by attaching a rigid upright bar—C—to the anterior surface of the crown, the only difference being that we distribute the direct force over a greater area. But if, as in Fig. 13, we attach to the lower end of C a traction wire or bar F, and further enforce the mechanical

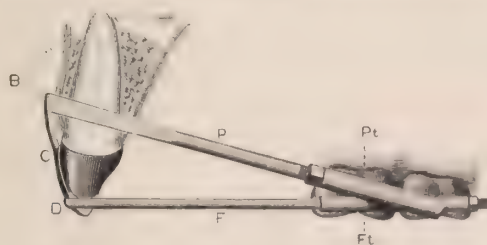


FIG. 13.

principles of our machine by uniting its posterior attachment to the anchorage of the power bar P, we will have neutralized our anchorage force materially and created an independent static fulcrum at D. Our apparatus now will distribute its force over the entire root and give us complete direction and control of whatever power we put into it. The entire tooth can be carried forward bodily or either end can be made to move the more rapidly. The force thus directed to the ends of the roots will have an increased tendency to move the more or less yielding and cartilaginous bone in which they are imbedded.

An apparatus for moving the roots of the anterior teeth in a posterior direction is constructed quite similarly—the direction of the two forces being reversed.

In that branch of my teaching entitled "Construction of Regulating Appliances and Their Management," I endeavor to arrange the work systematically according to the distinct mechanical prin-

ciples involved in the scientific application of the required force. I divide the whole subject under this head into two general divisions entitled respectively, action and reaction. Under the head of "action," which pertains exclusively to the movement of malposed teeth by the direct action of force, I take up: First, the movement of crowns in every direction. Second, the movement of roots in every direction, with or without the movement of their crowns. Third, rotating or turning of teeth on their long axes. Fourth, intrusion and extrusion or the gradual forcing of teeth in or out of their sockets.

The second main division of the work entitled reaction, pertains to the management of the opposing force to action. This I divide into: First, reciprocating or movable anchorages, describing methods for utilizing the force of reaction in the movement of other malposed teeth; and, second, stationary or static anchorage appliances. I do not mean by this that I confine the teaching of this work to a single branch at a time to the exclusion of all others, but I endeavor to blend them into each other, illustrating the principles, as I progress, with practical cases.

DOES THE PRESENT METHOD OF TEACHING BY DIDACTIC LECTURES,
BEST QUALIFY THE STUDENT FOR THE PRACTICE
OF HIS PROFESSION?*

BY JOHN S. MARSHALL, M. D., CHICAGO, ILL.

Mr. President and Members of the Association:

As a member of the Committee on Dental Education of this Association, I promised the Chairman, Dr. Henry W. Morgan, in an hour of weakness, that I would prepare a paper upon some aspect of the subject of Dental Education for the present meeting; and not having had the courage to disappoint him, I have made the best of a bad bargain by not wasting time or energy in the preparation of a lengthy article.

The Spirit of the times is one of progress. Everywhere in the secular and the religious world, this is made manifest by the universal desire for improvement. Men in every department of

* Read before the Southern Dental Association, Aug. 3, 1897, at Old Point Comfort, Va. Author's revised copy.

life are seeking after better methods of thought, of living and of doing things. They are casting aside the obsolete and useless, and are reaching out after those things which give promise of real advancement and improvement, though they may be never so small.

In the arts and manufactures, in science and religion, this earnest desire is uppermost.

The age is also a practical age, and every thought, enterprise or endeavor must have its practical side in order to claim the attention of the people. It is an age which has no patience with worn-out ideas, methods or dogmas. Forward is the watchword, and practical excellence the motto, and woe betide the individual, the corporation, the educational institution or the church which takes no cognizance of the spirit of the times.

For several years this spirit of progress has been "moving upon the face of the waters," and stirring the stagnant pools of our educational institutions. The foremost educators of our land are seeking for better methods of teaching, better preparation of the knowledge to be imparted, by arranging and classifying it upon the most approved scientific plan, so that it may be the more readily comprehended and retained.

Knowledge to be of value must be useful. To be useful it must be classified. When classified it is accessible and capable of being applied to the subject under consideration.

The faculties of the dental colleges have not been unmindful of their obligations to the student, nor of the spirit of the age, and have tried to keep their institutions well to the fore-front in this "onward march of progress." They have recognized the growth of the profession in its various departments, and have endeavored to keep pace with it. Many additions have been made to the course of study of the schools during the last few years, but nearly all of them have been upon the practical side, in the line of technique and laboratory work.

There is, however, great need of improvement in other directions, particularly in the present method of teaching by didactic lectures. The teaching in this line is just the same to-day that it was fifty or sixty years ago. A few colleges have made an attempt at improving the teaching in this direction by the introduction of other methods in combination with the lecture courses, but there has been no real advancement made which can compare with the work now done in the technique rooms and the laboratories.

In this respect we are behind the times, and need to bestir ourselves if we would maintain the reputation of the American Dental Colleges and the prestige of our graduates.

I shall, therefore, to bring this important matter to your attention, take the liberty of propounding the question which forms the title of this paper, briefly state my own views upon the subject, make a few suggestions and then leave the matter in your hands for discussion. "Does the present method of teaching by didactic lectures best qualify the student for the practice of his profession?"

My reply to this question is, No.

My reasons for this negative answer have grown out of a considerable practical experience, covering a number of years as a teacher in medical and dental schools. I can, therefore, approach the subject with the feeling that I am not a novice, and that perhaps out of this experience and observation I may be able to suggest a better method of educating the students under our care than by this inadequate and antiquated method of the past. I am fully aware, however, that many of my colleagues have also felt the inadequacy of the lecture method to instruct and educate in the best sense of these terms, and of their desire for a better means of placing before the students the subjects which they desire to teach. I feel confident, therefore, that out of this discussion good must come, and that if the suggestions contained in this paper do not meet with your approval, something better will be evolved.

My first objection to the didactic lecture method of teaching is that there are very few men in the profession who have the eminent qualifications to make successful teachers under this system.

The power to write eloquent sentences, to display oratorical pyrotechnics, or compose brilliant climaxes, are not qualifications for teaching. The orator and the stump speaker have no place in the class-room.

Entertainment of the students by funny stories is not the highest duty of the instructor. The paramount qualifications for the office of teacher, are ability to impart knowledge, and to teach the student how to apply it; but how few there are who possess both of these important qualifications.

Many teachers are able to impart knowledge, but few have the eminent qualification for the important labor of teaching how to

apply it. Knowledge without this power is like a library without a reader, "more ornamental than useful."

My second objection is based upon the undisputed fact, that a large majority of the gentlemen who occupy positions as teachers in our dental schools are busy practitioners, whose time is most fully occupied by professional duties, but who for the love they bear the profession are willing to give the best of the energy left to them each day, to preparation for the duties of the lecture room. Not one of these gentlemen, however, would say that such effort is the best that he is capable of doing had he more time for preparation and more energy to put into it. This objection can never be overcome until such time as men of wealth will endow these institutions, and thus make it possible for the schools to pay their professors a salary that will be sufficient to preclude the necessity of keeping up a practice for the sake of the income. Under such circumstances the entire time of the professors could be given to the duties of teaching and of original investigation; conditions which are greatly needed, and devoutly to be hoped for.

Another class of teachers go before their students with evidently some preparation upon the subject to be taught, but who frequently side-track themselves over the relation of some pet case in practice, and never get back to the text again that day. While another class, all too numerous, often enter the lecture room with little or no preparation, and simply talk against time, rambling over the entire field comprehended in the curriculum, and when the students leave the lecture-room they know no more than when they entered it, while their minds have become so befogged by this hodge podge to which they have listened, that they have no clear comprehension of the subject supposed to have been taught. This is not an overdrawn picture, for many of you know of like conditions, and the causes which have produced them.

My third objection is based upon the fact that no matter how eminent and well qualified the teacher may be as a lecturer, the students do not obtain such benefit from his wisdom as they have the right to expect and demand, for the reason that it is impossible for the average student--and this is the class that we have to plan for--to remember more than a few of the most striking thoughts presented in each lecture; while upon the other hand, if the student attempts to take notes, he loses at least one-half of the lecture, unless he happens to be proficient in shorthand. In some of

our schools the various classes have been in the habit of employing a stenographer to report each lecture upon certain subjects, and then have them printed for the use of the class, as the only means by which they could get the full benefit of the teaching.

The fourth objection which I would raise lies in the fact, that as a rule the students show their greatest weakness at the time of examination in those subjects in which they have been obliged to depend in large measure for their information upon a course of lectures. Listening to a course of lectures, and studying the same subject from a suitable text-book are not to be compared as a means of education.

To remedy these defects in this method of teaching, I would suggest that each lecturer should furnish to his faculty a full and complete syllabus of his entire course of lectures, and that the same be printed for the use of the students. These should be distributed to the class, one lecture at a time, as may be indicated by the teacher when he goes before his class. In this way the class could readily follow the lecture during its delivery, and be relieved from the necessity of taking notes, which at best are inadequate to a good understanding of the subject. Furthermore, the class should be quizzed upon each lecture by the teacher himself, or by an instructor especially appointed for this purpose, who is in sympathy with him. The syllabus should be used in this work instead of a quiz compendium. By this plan the lecture method might be stripped of many of its objectionable features. The teaching from the lecturer's desk and the work in the quiz room would then be uniform, and the most would be made out of this system of teaching that the circumstances would permit.

With these improvements in this method of teaching it would still be far from all that is needed, for many of the defects would remain without a remedy. I firmly believe that our whole system of oral teaching needs to be revolutionized by the introduction of suitable text-books and a system of recitations.

To my mind the recitation system of instruction is by far the most satisfactory upon all subjects not purely clinical or manipulative. It has been my experience, that with students who have been required to study a certain number of pages each day from a suitably prepared text-book, with the assurance that they would be closely quizzed upon each lesson, have shown a much better

understanding of the subjects studied than those who have been educated by the old system of didactic lectures.

Furthermore, by the use of carefully prepared text-books a systematic plan of study is followed, and the subject matter is classified and arranged in a natural order. Material prepared in this manner is much easier to comprehend and to remember, while the student is taught correct methods of thought, and to reason from cause to effect.

By following the recitation method of teaching the best instruction could be obtained from recognized authorities in the various departments to which this plan applies. The selection of the text-books might be placed in the hands of a special committee of the faculty who should, after conference with the professors of each department, announce to the students the books that would be required for each school year.

It has been the custom under the old plan of organizing dental colleges and in the selection of a faculty to appoint the men of best minds and of the largest experience in special departments to work in the lecture room, while the younger men who have their reputations still to make have been placed—to my mind—in the most important positions as teachers in the laboratories and the clinic rooms. This has worked to the disadvantage of both teachers and students.

By the adoption of the recitation system of teaching the younger men would be placed in charge of the instruction in the recitation room, with orders to follow the teaching of the authorized text-book. The application of the knowledge thus gained should be taught in the laboratories and clinic rooms by the professors themselves, rather than by a corps of demonstrators whose knowledge of and experience in the special subjects to be taught is often of the most limited nature.

With such a change in our system of oral teaching I believe much greater advancement could be made by the students in the same length of time, and we should have the satisfaction of knowing that they were better qualified for the practice of their profession than by the old method.

In conclusion let me ask :

Are those suggestions too radical? Are they based upon common sense? Are they practical?

The answer to these questions rests with you.

DENTITION, ITS LOCAL AND SYMPATHETIC DISORDERS.*

BY ALFRED OWRE, M. D., C. M., D. M. D., MINNEAPOLIS, MINN.

It was my intention at first to deal only with the sympathetic disorders of the two dentitions, nevertheless, I do not think a brief review of dentition in general and its local disorders will do anything but enhance the value of the main subject. Dentition has been variously defined as follows: teething, cutting of teeth, process of growth and appearance of teeth in the jaws, emergence of the teeth from the alveoli, arrangement and evolution of the teeth, and so forth. The human being has two systems: the deciduous or milk dentition, and the second or permanent. I believe the authenticity of a third has never yet been established.

Confining myself at present to the first dentition, it is claimed by medical scientists to be a physiological process, which I think is correct, but when the clinical reports of a large majority of cases are looked up carefully, I should make the definition a little longer and call it a physiological process of tooth eruption, which at times give rise to various pathological manifestations, both locally as well as in remote organs.

The epoch of dentition is one of great importance to the child, as it affects the whole economy more or less. Up to this time the food of the infant has been liquid, the appearance of teeth indicates a change to one of a more solid consistency. This increases salivary secretion as well as further development of the alimentary canal and its appendages. In short I may say that changes are going on in the entire organism, the tissues seem to be in a state of increased activity, which partly explains the susceptibility to disease. Just why this process is accomplished in many without the slightest discomfort or ailment is difficult to answer on any other ground but that of a strong nerve force and general sound make up of the machine. Normally, it begins about the eighth month and should be completed by the thirty-sixth, but this varies, as children are sometimes born with teeth and again the first teeth have been delayed until the fourth year. A few edentulous cases of both dentitions are reported, but like the third dentition are of rare occurrence. The symptoms of a nearly normal dentition are usually: increased flow of saliva, red and slightly swollen gums, a disposition to keep the fingers and all the flotsam

*.Read before the Minneapolis Dental Society.

and jetsam of the house floor in the mouth for the sake of biting upon them, slight febrile movement, thirst somewhat increased; peevishness and restlessness may be noticed. Dentition is considered abnormal when the foregoing symptoms are exaggerated and the appearance of one or more of the one thousand and one perverted conditions from Dan to Bathsheba, which are liable to occur. These can conveniently be divided into two classes.

First: local disorders, due to local or general causes, and secondly, the sympathetic disorders. Of the first class we have an endless number of perversions, hence, I can but briefly allude to them. In notable retarded dentition we may look for rachitic, strumous, syphilitic or tubercular tendencies, or possibly marasmus as a consequence of chronic or acute disease. Malformations of the jaw bones sometimes delay the eruption. Premature development and eruption does happen occasionally, but the roots of such teeth are usually rudimentary, hence are prone to early shedding or decay. The etiology in these cases is somewhat obscure. Some milk teeth may be well preserved to a late period in life, where the permanent follicles were either rudimentary or never developed. Again the ordinary succession of teeth may be interfered with, such as the superior incisors appearing before the inferior. I remarked previously about edentulous cases where neither deciduous nor permanent teeth were ever developed, which doubtless is explained by an entire absence of the elementary follicle, or their early destruction from alveolar disease. Absence of classes of teeth is quite common and is usually symmetrical, but several cases of asymmetry are recorded by good authorities.

However, if this occurs in the deciduous dentition, it does not necessarily indicate a deficient number of the permanent, and on the other hand the second set may be minus one or more when the milk teeth were normal in number. Frequently supernumerary teeth are observed and their development may be due to accidental segmentation of the elementary follicles, but is usually ascribed to extra follicles.

Those of the first system occupy as a rule, abnormal positions, crowns are of conical shape and relatively small size; those of the second dentition closely resemble the latter physically, but more often occupy the place of the permanent tooth, they are apt to perforate the palate bone in proximity to the normal arch and appear somewhat earlier than the permanent teeth. Anomalies in

position are caused either by the development of the dental follicles in an abnormal position, or by the interposition of some obstacle in the path of the normally located follicle.

Both of these disorders are often typically illustrated by the troublesome inferior wisdom teeth, which may erupt even as high as the coronoid process. In the superior maxilla teeth may be forced through the hard palate and rarely into the nasal fossa, antrum, and so forth. Faulty direction is another local disorder, due very much to the same causes, but a thorough consideration of this, as well as abnormal position, properly belongs to the subject of orthodontia, hence I only mention them as disorders. The structure of the milk teeth when faulty, is usually referable to a morbid constitution, such as struma, rhachitis, etc. The permanent teeth may have morbid histological changes from the same causes; acute infantile diseases, particularly the exanthemata and typhoid fever; various forms of stomatitis, congenital syphilis and the abuse of mercurials. Any unusual obstacle to the eruption of the teeth may excite morbid processes. As for instance, narrowing of the dental alveoli by the approximation of the labial and lingual borders of the process. This is very liable to occur in rhachitic children, and is aided by the constant pressure of the tongue and lip muscles. Abnormal thickness of the gum tissue is another obstruction, but whatever the resistance, the growing tooth exerts undue pressure upon the exquisitely sensitive branches of the fifth nerve, which causes more or less pain. This pressure may also induce congestion of the matrix, and possibly go on to inflammation and gingivitis, which again may end in suppuration. With this condition in the mouth already, add the parasites of the foreign articles the child plays with and a severe stomatitis is a complication easily explained.

The extreme degree mentioned may not always be reached, but on the other hand the disease may go beyond, cause periostitis and even caries or necrosis of the alveoli and destruction of the teeth. Glandular enlargements may also be observed, particularly in the submaxillary and cervical regions. This is noticed more frequently in scrofulitic children, although the local irritation may have passed away before the glands are enlarged. The gums vary from slight swelling to ulceration and sloughing; the tongue and buccal mucous membrane more or less hyperæmic, and may be complicated by aphthæ and ulceration, cheeks red and tumefied,

and even abscesses of them are reported in severe cases. Under the head of sympathetic disorders of the first dentition, I think it is safe to name the following : gastritis, gastro-enteritis, entero-colitis, otitis, conjunctivitis, coryza, bronchitis, cutaneous eruptions, such as urticaria, herpes and eczema, retention and incontinence of urine, dysuria, nervous cough, vomiting, laryngismus stridulus, subsultus tendinum and eclampsia.

Now I do not wish to state positively that dentition is at the bottom of all the diseases enumerated, when they occur during the periods of dentition, but still many of our best authors claim that such is the case to a large extent. Others say there must be a predisposition to their development ; this predisposition is then defined as a cachexia. The loss of appetite, and consequently interfered nutrition, may play some part in the production of disease, also the increased saliva and other active changes. Dr. W. H. Day, in a text-book on diseases of children, remarks that the evolution of teeth tests the vigor of the child, and the more tardy and lingering the process the less its strength and vitality. Consequently, if the dentition is of long duration (especially when with slight morbid manifestations), the nervous energy of the child is low and used up, and greater susceptibility to disease ensues for the time being, and until strength is regained. However incomplete the link of etiology may be, we know that the epoch of dentition, like that of puberty, is one in which constitutional disturbances are of common occurrence. Again, it is also admitted by good authority that these diseases may be entirely accidental complications of dentition. This is especially true when the local symptoms are very mild or entirely nil. But if the latter be very grave, I think the process is fully able to act both as a predisposing and exciting cause of sympathetic disorders. It may be a reflex act, in which the fifth is the chief afferent nerve, and as the vasomotor center is converted into efferent impulses, affecting the organs which are most low in vitality. Or some diseases may be due to an extension of inflammation from contiguity of tissue, such as coryza, otitis, conjunctivitis and inflammation of the membranes of the respiratory tract. The designation, disorders of dentition, like, for instance, the diseases of pregnancy, does not indicate that they are peculiar to either, nevertheless the laity, to a large extent, seem to think that every infantile disease occurring during this period is due to and dependent on the teething process, and their treatment in many cases neglected.

Entero-colitis has the same clinical importance now as at any other time, and should be treated accordingly. The sooner the public are impressed with this fact the better. For these reasons it may be well to inform them that dentition does not always cause the various ailments observed during this time. The dentist is, as a rule, seldom consulted in these cases, though, if he should be called, it is his duty, aside from the dental aspect, to refer the parents to the physician if any symptoms indicate such action. As the clinical history is exactly the same, as if these diseases occurred at some other time, and it is really not within the dentist's scope to be versed in them, I will not take the time to review it now. Nevertheless, to be able to diagnose the causes of some of the constitutional or sympathetic diseases will often be valuable, hence, in general I should say, that if there are no morbid signs in the mouth or jaws it may be inferred to a degree that other causes are present. Again, if the disorder manifests itself at each epoch of eruption and then ceases, the etiology may be ascribed to perverted dental development. The treatment should interest the dentist as well as the physician, although the former's mission may be, and generally is, somewhat limited. Owing to its broad medical relation I will try to bring out only what is of most interest to the doctor of dental medicine. It is divided into preventive and curative, both either local or general or combined, as the case demands. Prophylactic measures are, I am sorry to say, not advancing as rapidly as they should, according to present medical investigation, but I hope some day to see this branch of therapeutics in the lead. To obtain this result the dentist can do his share, sometimes a little more, hence, we should never lose an opportunity to lecture prophylaxis to our patients. Personally I have noticed its good effects in many cases. Locally the preventive treatment consists of frequent cleansing of the mouth with a mild antiseptic solution, such as listerine, euthymol or boracic acid; another excellent local treatment is gentle massage of the gum with some hard, smooth object. This the patient seems to do often from natural inclination. General prevention embraces the full application of hygiene, and to build up the general health, give the child plenty of fresh air, carefully select the diet, look after digestion, regulate the bowels. Tepid or cold bathing every day not only reduces convulsive tendencies, but also lessens the great liability to catarrhal inflammation of the respiratory tract.

Curative measures are indicated in all cases of severe stomatitis, ulcerations, periostitis, abscess formation. Usually about all that is needed is lancing or curretting and a stimulating antiseptic wash. I do not think it at all necessary to lance when the gum is merely soft and no swelling or inflammation present, besides it leaves a possible path for infection. If local, surgical interference is not advisable, owing to hemorrhagic diathesis or other dyscrasia, we must rely on such general curative and prophylactic treatment as the symptoms best indicate. In these cases the bromides and chloral in small doses are valuable, also cold applications to the head. Carthartics and warm enemata may be required. While the foregoing remarks on treatment are rather brief, I hope they cover the ground as far as our profession is concerned.

Disorders of permanent dentition. The most frequent local cause is obstruction to the normal eruption of the teeth. It may be a deciduous tooth retained too long, ossification of deciduous follicles from which the teeth have been prematurely removed, abnormal shape of the alveolar process which forces the teeth through bony structure instead of the gum. Faulty direction or development of the follicle, supernumerary teeth and fibroid induration of the gum, etc. All teeth are liable to meet with these difficulties, but the third molars seem to be more often encountering some obstacle, and of these the inferior most frequently. Perhaps this is due to their later eruption and the place encroached upon by other teeth. The symptoms vary, but in general when an obstacle is met the direction of the tooth is changed and it may be against neighboring teeth or against the cheek or tongue. It excites either congestion or may progress to suppurative inflammation. The extension of same and pressure within the follicle may cause periostitis, osteitis, exostosis, caries or necrosis of the jaw and teeth; abscesses in connection with the eruption or noneruption of the inferior third molars are quite common, and if left to nature may burrough down the throat and neck muscles and eventually cause an external opening, or they may take on a chronic character and remain for years. Articulation and mastication are greatly interfered with in many cases, and in severe forms spastic contraction resembling trismus ensues, which is usually confined to the masticatory and neck muscles; dysphagia, though a rarer complication, is not uncommon; salivation and febrile disturbance is almost always present to some extent; occasionally we can trace tonsillitis, pharyngitis, otitis, rhinitis and

conjunctivitis as sequelæ or concomitant with a disordered second dentition.

The chief sympathetic disorders of this dentition are neuralgia of the fifth nerve, which may develop into a hemicrania, tic douloureux, spastic contraction of muscles, of mastication, facial paralysis, otalgia, aphonia, hysteria, tetanus, chorea, epilepsy, of which the last five named are of rare occurrence.

Wherever there is a predisposition to nervous diseases, these sympathetic manifestations are more prone to occur, hence, with these patients too much stress cannot be laid upon preventive treatment, both local and general; neither must it be overlooked as I have previously spoken of in other cases. Prophylaxis must be begun in early childhood, as the etiology dates back so far in many patients. Locally, prevent ossification of deciduous follicles. If already in this condition, trephining may be indicated. Preserve milk teeth in healthy condition, and keep in the mouth as long as possible. The extraction of supernumerary or too large teeth of either set, may sometimes be necessary if the jaws are too small.

As to the general prophylactic treatment it must wholly be taken care of by the physician. The local curative measures must be directed as to the symptoms of the case in hand indicate, due promptness here will often not only relieve the local trouble, but also arrest sympathetic disorders. I never hesitate to use the surgical instruments necessary to abort a dreaded condition. It is often practicable to extract a good tooth to gain relief, but in such cases we must do the best we can under the circumstances. Anæsthesia may have to be resorted to for trismus as well as for its chief effect of relieving pain. The dentist, as a rule, does not treat the sympathetic disorders, and inasmuch as a thorough consideration of them would occupy more time than I have already made use of, I will not attempt to discuss their treatment in general any more than to say that such cases should be turned over to our medical friends with all due respect, not only as a matter of courtesy, but since their etiology is usually nerve derangement, it would be a hopeless task for the dentist, without the electrical appliances and knowledge of a nervous specialist to do very much good in this direction. Although there still remains much more to be said upon this subject which we already know is so, I think there is yet more to be brought out in the future, about which we know comparatively little at present.

THE RELATIVE VALUE OF FILLING MATERIALS.

BY C. F. HARTT, D. D. S., CHICAGO, ILL.

The relative value of a filling material is probably one of the most difficult problems that may be presented to a mathematician. The relative value cannot be determined or expressed, for the reason that it is impossible to say that any one material at present in use is the best, or may be expressed by the figure, say 100. There is no doubt that nearly all dentists would at the first moment say, that relatively speaking, gold is the best material in the largest number of cases, yet it is equally true, notwithstanding such a verdict, that gold in a great many cases may be the very worst material to be used.

Our profession consists of saving teeth, and let us not condemn the man, who saves teeth through the frequent use of gutta-percha, as a filling material, or the much abused amalgam. For relatively speaking it is not determined, but what some form, of a preparation of the latter materials, may not some day be the standard. It has heretofore been customary to begin an article of this kind with gold, and end up with gutta-percha, discussing all articles that come under filling materials, between these two articles mentioned. Now for a change, let us reverse the order of things.

What position does the despised material, gutta-percha, hold as a material for saving teeth? The younger element in the profession will at once condemn it, but as we grow older, and learn to have more regard for the feelings of our patients, we become to look upon the crude gutta-percha, such as we buy for making base plates, as a boon to mankind. One would hardly realize how much of this material is used by the busy and advanced practitioner, and how many teeth it is saving continuously.

How many of we dentists have not had, at one time or other, red gutta-percha used in our own teeth, and have kept it there for years, for the reason that it answered the purpose and felt comfortable in the mouth; now what else is necessary if we consider the purpose we are trying to carry out?

One may think that it is the simplest thing in the world to insert a gutta-percha filling. Not so however. It is as difficult to insert a good lasting filling of one material as well as of another, but a filling inserted of the base material, for temporary purposes, will very often last a great many years, and why? Because it answers the purpose of excluding moisture, and in stopping a cav-

ity in a tooth, which is our aim. Is there a material which does it more satisfactorily than this? If so I should like to know it.

Next to gutta-percha, we may consider the different forms of cement. Of course it is not expected that I should go into the details of the composition of the different cements now in the market, but relatively speaking, the cements occupy a very prominent position in the list.

The position of Dr. J. Foster Flagg is not occupied by him alone; there are others who use cement and so-called plastic filling materials only, and exclude all metals from the operating table.

The trouble with us gold workers is, that in the first place we do not know how to mix a cement, nor how to insert it, nor how to finish it. Why? The answer is easily given; because we have no confidence in the material. Why is it that we see so-called cement or bone fillings, in the mouths of patients that had been inserted across the ocean, five and ten years ago, whereas we tell our patients that fillings of this kind do not last more than two or three years. The only solution in my mind is that we do not know how to handle the material, though we may know how to insert beautiful gold fillings.

What the relative lifetime of any filling is, is something we must determine before we condemn the cements for permanent fillings. I think the average life of a filling of the average practitioner is not more than five years, though we see fillings that were inserted twenty-five and thirty years ago. Of course, each one of us will say, "I am sure my fillings on an average will preserve teeth for a longer period than five years." I however have the privilege of doubting this.

The group of amalgams is such an important one that we will only devote a few remarks to them here, and I would suggest that each group be considered at a special meeting and that papers be presented by men who excel in the handling of any one material.

What would dentistry be if amalgam had not been discovered for this purpose?

It would be impossible to save one-half the teeth that are now kept in the mouth for years and years if it were not for this filthy material, which a great many men profess they never use, and consequently decay.

I am almost inclined to believe that it is a similar case of a man who spent a fortune to have the saloon routed out, but who had a very extensive wine cellar himself. Amalgam is and always

will be the filling material for the masses, and whatever is good in the majority of cases, no matter how poor it may be in some instances, is bound to remain.

One of the best materials, if we were willing to learn how to insert it, is tin, and if my word carries weight, I would suggest that the students in different colleges be compelled to use tin foil, in majority of cases where now amalgam is being used. Any man who may be able to insert tin fillings will easily become a good gold worker, but not after he has become a slovenly amalgam worker, will he ever be able to handle gold successfully.

Tin possesses qualities which, if these qualities were possessed by gold for instance, it would be the filling par excellence. These qualities I refer to are in the first place nonconductibility and adaptation through its softness. It is true tin is rather a soft metal, but it is nonoxidizing, which makes it compare with silver or any other metal used alone excepting gold, a great deal more valuable. Besides amalgams of the old class we have a great many materials that are getting into the dental office for a short time only, among these I may reckon all the copper amalgams.

These materials, prepared mostly by dentists who like to earn money outside of their legitimate profession, are of very little use, as experience has taught us. It will in spite of all our endeavors to avoid it, sometimes become necessary to remove a filling, and who has not at one time or other cursed the hard and coal black filling which it was necessary to remove. For this reason alone would I condemn copper amalgams, not taking the bad color in consideration.

Gold is the material which has stood the test of time, and it probably has done so on account of its possessing more of the required qualities than any other single material now in use. Its advantages are in the first place that it may be welded together at any temperature; were it not for this, gold would probably not be used at all, yet in former days and even now, by older practitioners this property is somewhat destroyed and used in the form of soft gold, but to produce contour fillings and the restoration of lost tooth structure, we must depend upon this property first, last and all the time. Gold has several bad properties, among these is the color; it is probably less like the color of teeth than any other, but its color being permanent, this disadvantage becomes to some extent wiped out. It is of all materials the best conductor, which prevents its use in a good many cases, or at least it ought to pre-

vent its use in a great many instances, but unscientific and unprincipled men in the profession will insist in using it where its use is absolutely detrimental instead of otherwise.

One more objection is the difficulty its use entails; no one who has not tried difficult fillings can appreciate this.

Then the manipulation of gold may be done in a great many different ways, and even in the use of instruments its relative value would come into consideration. Some men may not be able to insert fillings with instruments that become in the hands of others so valuable as to be indispensable, and vice versa. Now, I think I have thrown out hints enough for a discussion as to the relative value of filling materials; but for myself I think the relative value of a filling depends more upon the operator than upon the material. If, however, the discussion precipitated this evening, will prove to me the contrary, I shall conform to the ideas of greater minds on this subject.

ART IN DENTISTRY.*

By GEO. W. SCHWARTZ, M. D., D. D. S., CHICAGO, ILL.

"The art to please is a potent charm." This is especially so in practical dentistry; it is quite possible to do good and serviceable work for a patient, yet the work may be completely lacking in artistic restoration. At the present time we have in our profession scores of dentists who are doing serviceable work but who are almost devoid of any artistic progress, or conception, whatever. I will say the first requisite of the dentist is to be able to properly attend to decay of the natural teeth.

Second, to put them in their proper position and relation to each other, keeping in mind the proper facial restoration.

Third, to be able to make such restorations of lost teeth, or portions of teeth, as are most fitting to the case in hand.

Why is it we have such a lack of artistic work? Surely it is not a general lack of ability on the part of the dentist as some would have us believe. I attribute it to the greed for money and gain in riches more than anything else, combined with a distaste for the slower and surer method of gaining a solid practice.

We will first take operative dentistry. I will consider the work done as it usually is, without contour, proper polishing, etc. What would it mean to have made a different filling? Instead of finishing the filling at the first sitting, it would mean the slow

* Read before the Odontographic Society (Author's copy).

process of separating, in many cases after separation stopping with gutta-percha a week for the soreness to pass away, next filling, consuming two or three times the amount of time usually spent in building up, shaping and carving. Last, the final polishing; very few dentists in general practice carry this out to its ultimate conclusion. If they did the serviceability of the work would care for itself.

Next in order comes the regulating of natural teeth. How very few dentists can truthfully say they do put irregular teeth in their proper position; not many. It has long been a question in my mind if regulation was not the most important operation on the twelve anterior teeth, because if they are put in their proper position and relation to each other it lessens the liability to decay in every case. One of the most frequent forms of irregularity is the over or under lapping of the upper lateral incisors. In all these cases the liability to decay is increased. Many of these cases can be easily corrected if taken at the proper time, often only requiring two bands and a few ligatures; sometimes nothing more than the proper tying of silk floss for a short time, followed with a retainer for a month or so. What could be more artistic than to put such teeth in the place nature intended them to grow, and not only restore the facial expression, but prevent the unsightliness of gold fillings in them also. We owe much in this line to Drs. Case, Younger and Angle. It cannot go unnoticed how really few artists we have in this line of work compared with the many who are dabbling in it. In many cases it is because the student has not had the proper instruction in the work. I can compliment the dental colleges in Chicago for having such renowned teachers in this branch of dentistry, their reputations being known throughout the dental world.

While I have put porcelain work third in place in this paper, I do not consider it of any small importance. The dentist practicing artistic, as well as serviceable dentistry, will be called on at the present date to do as many operations in porcelain as any other line of work. While there are many dentists who are doing porcelain work whenever it should be done, the majority are not doing any whatever. I am going to make a statement that may not be accepted by many here this evening. It is that the dentists who are not using porcelain in their practice are not up to date in crown and bridge work. When I say porcelain work, I mean porcelain baked for each individual case. I will briefly mention some

of the cases where, from an artistic and æsthetic comparison, porcelain should be used. I have for the past four and half years ceased using gold in any of the teeth where it is very noticeable, more especially so in the mouths of women who are particular about their personal looks. For instance, take any of the anterior teeth decay involving one-third of the labial aspect, or more, of the tooth, I recommend the restoration be done in porcelain, even if at the sacrifice of the pulp of the tooth. If it is a question of saving the pulp, or making the proper artistic restoration by devitalizing, I unhesitatingly choose the latter if the patient is of an age when the tooth and pulp are thoroughly developed. While I am speaking of the anterior teeth I wish to say a few words regarding the crown I usually make when the roots are in good condition; it is one without a band. I prepare the root by grinding concave labially, to the middle of the root, slanting upward and backward to the palatal. By this preparation the danger of splitting the root is reduced to almost as small an amount as if it were banded. After I have this preparation, I take an impression of the root in heavy platinum foil, trim to the size and shape of the root; I then push the post through the foil into the root and solder. The next step is to fit and solder the facing, after which I bake porcelain to fill in and contour the back. After I have the case baked I remove the platinum foil, as it is merely to answer the purpose of a matrix to bake the porcelain the proper shape. Those who do not use this style of crown can only appreciate it by seeing it as applied to a case in the mouth. There are no unsightly joints, or discolored margins of the gums. I really feel sorry for the patient whose dentist is unable to make an inlay or porcelain restoration when the case demands it. In my own practice I seldom make a gold bridge or gold crown for any part of the mouth, and then only when the bite is so short I make a gold bridge without the use of porcelain facings, using metal only.

Before closing my paper I wish to speak of the value of modeling in clay in connection with the study of the anatomy of the teeth. While we already have valuable and thorough instructions in operative technique in the prosthetic department, we need more thorough instruction in the study of the anatomy of the parts to be reproduced. I think there is no better way of getting it than by modeling with clay, getting the hand as well trained to the work as the mind and eye. In porcelain work this cannot be overestimated. Three other dentists and myself spent a very pleasant time not

long since in modeling in that way for about three months. We met once a week, took Black's Anatomy of the teeth as a guide, selected a certain tooth to model, and worked all evening at it for the purpose of thoroughly learning the anatomy of it. It makes a lasting impression to model, where it would soon be forgotten if studied from the book alone.

In concluding this paper, I know I have said nothing very new, but have aimed to speak about something in dentistry that is being much neglected by the average practitioner of to-day.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

RESULTS OF EXPERIMENTS BY DR. PECK.

Dr. A. H. PECK, Chicago: These experiments occupied so much time we were compelled to forego the use of many agents until some future date.

Because of many questions that have been asked by various members of the society regarding this work, I will make seemingly necessary explanations as we proceed.

As I stated yesterday these experiments were conducted in the following manner: Tubes, containing on an average eight c. c. of sterilized broth were used. The broth was infected with the saliva of various members of the class. In connection with each set of plants a control tube was used, which latter invariably presented unlimited growth.

The observations from which these results were compiled, were carried on through a period of three days.

The tube containing one drop of oil of cassia, presented no growth.

Oil of cinnamon one drop, no growth.

Dr. Black's 1, 2, 3, one drop, no growth.

You heard more or less said yesterday afternoon regarding the use or nonuse of oil of cassia and the reasons that were presented. I have been asked by many about the use of 1, 2, 3, which is composed, as you well know, of cassia, carbolic acid and gaultheria. Whether or not it is irritating to the soft tissues as is cassia, I will simply state that I have experienced no such trouble, and Dr. Black is inclined to think that when the three ingredients are properly mixed, there is more or less of a chemical union be-

tween them, so that the individuality of each separate agent is lost to a greater or less extent.

Oil of cloves one drop, no growth. I will state that in connection with this agent I was much surprised to find no growth in the tube containing one drop, and several subsequent plants were made that the result of the first might be verified, which was invariably the case. Since oil of cloves has proven to be such a potent antiseptic, and also because of its soothing, quieting effect on irritated, soft tissues, it has become a favorite agent in my practice.

Beech-wood creosote, one drop, no growth.

Myrtol, two drops were required to prevent growth.

Cajuput, five drops, no growth.

Eucalyptus, (Sander's), six drops, no growth.

Eucalyptus, (Merck's), seven drops, no growth.

Carbolic acid, 95 per cent, three drops, as I stated yesterday, restrained the growth for three days, after which time the bacteria developed abundantly.

Gaultheria, five drops, growth. I will say here, that when growth is reported as following the use of an agent that said agent was used up to a quantity that formed a saturated solution in the broth, thus rendering it useless to experiment with larger quantities.

Terebene, five drops, growth.

Eugenol, eight drops, growth. One of my greatest surprises occurred in connection with the results of eugenol. I had been in the habit of using it a great deal and had considered it quite an effective antiseptic, but finally had to give it up as absolutely worthless as such.

Bichloride of mercury, one to one-thousand solution, six drops restrained the growth, i. e., the bacteria developed to a certain extent.

Hydrogen peroxide, (3 per cent), four drops, no growth.

Peroxide of hydrogen, (Marchand's), three drops restraint, five drops, no growth.

Pyrozone, (3 per cent), four drops restraint, five drops, no growth.

Borolyptol, ten drops, no growth.

Euthymol, ten drops, growth.

Listerine, ten drops, growth.

Formaline, (10 per cent) five drops, no growth.

Resorcin, (15 per cent), six drops, no growth.

Lysol, (10 per cent), ten drops, no growth.

Iodoform, saturated solution in the broth, the bacteria developed as if nothing had been present.

Nosophen, saturated solution in the broth, result same as iodoform.

CHICAGO DENTAL SOCIETY.

Regular meeting was held at the Columbus Memorial Building on Tuesday, May 4, 1897, the President, Dr. A. H. Peck, in the Chair.

Dr. ELY read a paper entitled "Anesthesia of the Dentine, with Results of Experiments."*

Dr. AMES: Dr. Ely refers to Dr. McGraw as being an early experimenter in this line. I happen to know personally considerable about this. It was in 1889 that we had our twenty-fifth anniversary meeting here, at which time Dr. Weeks read a paper I believe by Dr. McGraw, or Dr. McGraw read it himself; but during the summer of 1888 I happened to attend the Minnesota State Society, when Dr. McGraw demonstrated his method, and inasmuch as I was working along some similar lines myself at that time, treating various conditions by electrolysis, an arrangement was made by which Dr. McGraw gave a clinic on the Sunday morning following the week of the meeting, and we had a fairly satisfactory demonstration. I questioned at the time and until recently whether what was accomplished by Dr. McGraw was the introduction of cocaine. I argued at that time that it must be simply a matter of electrolysis, and with electrolysis the cocaine must be broken, and he must be getting something else. I see now where my error was at that time, but I still look on it as a matter of electrolysis pure and simple. According to my present opinion there has never been an excuse for coining the word cataphoresis. The reason I did not comprehend this subject at that time was that I did not recognize that the hydrochloride of cocaine was simply the salt of the alkaloid, and that in this electrolysis of a solution of hydrochloride of cocaine the alkaloid went in one direction and the acid radical in the other. The alkaloid goes toward the negative pole, enters the tissues, and the acid radical is liberated about the positive.

So much for Dr. McGraw, except that I think as Dr. Ely does, that more credit should be given to him for his early work in this line. It is unfortunate for him, and unfortunate for all the profession, that he did not follow it up. I attribute this largely to

*See page 621.

the lack of helpful apparatus at that time, which probably made his results less successful than our results to-day, and caused him to become lukewarm on the subject.

Great credit is, of course, due to Dr. Gillette and Dr. Morton. I am sorry, however, to be obliged to say in regard to some of the work of Dr. Morton, that I cannot duplicate some of his experiments. I am afraid that Dr. Morton jumped at conclusions in some of his statements made, because in making serious and conscientious efforts to duplicate his experiments I have been unable to get similar results. I speak more especially—not to say anything that would detract from the value of the process, but from some of his conclusions of his statement as to the behavior of iodine in the tissues, that it goes from positive to negative, and the bleaching of permanganate of potassium by hydrogen peroxide being facilitated by the current. The very fact, as Dr. Morton states, that there are exceptions to the rule of the flow being from the positive to the negative would prove to me that there is not, in a general way, such a thing as cataphoresis; that it is simply a matter of electrolysis and the flow in the solvent depends upon the preponderance of positive or negative elements in the electrolyte. Dr. Morton speaks of an alcoholic solution of bromide of barium being an exception; another exception being a solution of eosin, an organic coloring matter. Well, we need not go into anything as complicated as that to find electrolytes which will give a flow in the opposite direction, and I have been satisfied for nearly a year that there is a great deal that will have to be revamped in our ideas on this subject.

Dr. Ely spoke of reversal current. I do not suppose there is much danger of that. I went to considerable trouble at one time to rig up my apparatus so that I could not possibly get an accident from the reversal of current, but I suppose, with the Edison current there is very small chance of that, because if their meter system amounts to anything they would be owing you something at the end of the month, and they would not be apt to do that; though I do not believe their meter system helps them much in assessing for the small amounts used by the average dentist. They make a bluff with the meter and make a guess as to how much to charge you, so I am not sure but what the current may be reversed. I have taken the trouble to guard myself against that absolutely.

The insulation of your positive electrode is of prime impor-

tance. You not only have failures from allowing a leakage of current through the gum or through a metallic clamp, gold fillings in adjoining teeth, or by some such means, you not only have failures, but I can see where possibly the dire results that have been attributed to cataphoresis might come from this same leakage of current. I think your cavities should be insulated from the adjoining gum tissues, from adjoining gold fillings and you should avoid particularly putting a metallic clamp upon the tooth in which you have an electrode. I have a simple means of insulating a tooth, if I have a rubber dam on several teeth. I simply take a small piece of rubber and slip it over the tooth on which I am operating; then if there is an adjoining gold filling and any chance for leakage there is perfect insulation. A fine wire with cotton entangled I find the most practical positive electrode. Ordinarily this can be simply wedged into the cavity. I take pains to have a considerable layer of cotton around the wire, and cotton in the deep seat of the cavity, rather than have a coil of wire against the part which I wish to anæsthetize. The current takes the most direct course, and I have found that often I would have the seat of the cavity anæsthetized and all the base of the cavity, and yet up somewhere under the enamel, where it was not in the direct line of the current, I would not have the same anæsthesia that I would get in the deeper portions, which were in the direct line of the current, the line of least resistance.

Electrozone I have not used. In regard to the strength of solution I would say that I aim to have a saturated solution. I do not make a solution specially, as I make it by dipping a moistened pellet of cotton into pulverized crystals of cocaine hydrochloride and make sure to have enough. I am not afraid of the amount of cocaine I use. That question has come up often, and my belief is that we introduce an infinitesimal quantity of cocaine—an infinitesimal quantity answers the purpose, and if we have the parts properly protected there is no disadvantage in having any excess there and get well rid of it afterward. I aim to have a well saturated solution.

Dr. Ely did not speak of the mil-ammeter. I do not use one myself (because I have been waiting to change my office), but I am satisfied it is an essential. We are working in the dark when working without a mil-ammeter. We are not absolutely sure sometimes whether the patient is getting any current at all, that is, I

am not, and if we have a mil-ammeter we know that they are getting some, and we know how much they are getting. There has been a danger with me, sometimes, of cutting recklessly into a tooth that I had thoroughly anæsthetized; we can cut so freely that we are very apt to expose the pulp. My experience is about like that of Dr. Ely. I exposed a pulp once, and after that I have been more careful.

The time, I find, varies. Ordinarily I get pretty good results in about fifteen minutes, crowding it along as fast as the patient can stand it. I have found cases where I would need to anæsthetize through a considerable layer of dense tooth structure, with an abraded molar, for instance, needing plating over, I find that it takes a high voltage and considerable time. I have had to use as high as twenty-four volts in such a case and take considerable time. Where there is a good sized cavity and not much of a layer of dentine between electrode and pulp, it naturally takes much less time. For anæsthetizing an exposed pulp I find a lower voltage and shorter time usually answers the purpose. Where a pulp has been inflamed for days a low voltage and much time is required, since the irritable pulp will not tolerate sufficient voltage to obtain a quick result, and where calcification of pulp tissue has taken place there is often great irritability and great resistance to voltage as well.

Dr. H. A. CROSS: Before the discussion is continued any further, there is one point I wish to bring out. I have used the cataphoretic outfit but a short time; however, I have used it long enough to discover that by its application for six minutes I have been able to remove a live pulp entirely painless, in some cases, and on the other hand I have applied it for about forty-five minutes with two or three short interruptions on an exposed pulp on the same plan recommended by Dr. Ames, without success. I did this by following my own judgment, without special instructions regarding it, and I wish to say that that exposed pulp was in a lower molar, had a good wall of dentine surrounding the entire exposure, there was no chance for any wandering of the current, or its being diverted into the gum tissue. I applied it for about fifteen minutes. I then could not touch that pulp without great pain to the patient, and I applied it for fifteen minutes longer with the same result. I again tried it fifteen minutes longer and I could not remove that pulp; I gave it up and applied arsenic. (In discussing Dr. Ely's

paper at the May meeting of the Chicago Dental Society, I referred to my experience with a certain patient upon whom I used cataphoresis for forty-five minutes without success. Since the occasion of that meeting I have had another cataphoretic experience with the same patient, and by its application for one full hour without interruption, I removed painlessly the live pulp of an upper molar.) I wish to say that my experience is such that I am of the opinion that there are some patients whom it would be exceedingly difficult to anæsthetize locally.

A MEMBER: Is it not possible that you had a reversal of the current?

Dr. CROSS: I had a storage battery.

A MEMBER: And you are sure you had the same electric current?

Dr. CROSS: Yes, precisely the same.

Dr. GEO. B. PERRY: My experience in the use of cataphoresis has been comparatively limited, but I will say a few words in regard to the use of the instrument which I have in my possession. I use a McIntosh outfit, a milliampere meter, shunt wound rheostat made of slate covered with graphite. There seems to be in the application of electricity through this instrument apparently no break in the current unless it might be caused by the disintegration of the particles of graphite which is slight. It has been my experience that it is quite necessary to keep the cotton moist continuously, for as the current increases the moisture seems to dry out proportionately. If the cocaine or other substance on the pledget of cotton reverts to its crystallized form and becomes dry, the pain apparently intensifies with a slight increase of the current.

I also find in giving it to different patients that the ohms of resistance in their body ought to be considered. It was stated by a writer in one of the journals not long ago that the difference in the application of the negative electrode to the hand and the side of the face was from 3,000 to 5,000 ohms. If the negative electrode was applied with a wet sponge in the hand, the ohms of resistance were greater then they were when applied to the side of the face.

In applying the electricity I use a metal clamp, and I have for an attachment to that clamp a little ball-bearing arrangement, a sort of extra clamp, if I may so call it, which fastens onto the large clamp and holds the positive electrode, the outside of which is

covered with vulcanite, the platinum wire passing through the center, and this connection being made at one end with the wires, so that there is no actual metallic contact with the adjustment of the clamp. The platinum wire is very small, very flexible, and one can bend it around into the cavity in any position and hold it firmly. It is immovable unless you happen to break the wire. In that way one can apply the electricity to the cavity without interrupting the current by any outside mechanical movement.

The time required to complete anæsthesia I have not as yet determined. I have experimented hardly long enough with it to really come to any definite conclusion, but I think it safe to say it averages about fifteen minutes.

Dr. PRICE CHEANEY: One of the suggestions made in regard to hypersensitive dentine and the difficulty in using cataphoresis where you had hypersensitiveness, or where you have an inflamed pulp, has suggested to me a little incident in my own practice which might be of benefit, and therefore I will mention it.

Some time ago, in preparing a case for bridge work where a loose crown had been used on a tooth for some time so that it was in a very hypersensitive condition, I found that on the application of the current it produced intense pain and it seemed to utterly resist the application of the current for some time and finally the idea suggested itself to me to apply a little morphia with my solution and it worked like magic. I find it has helped me out of a good many tight places, and a soothing application of morphia will help you to turn on your current much more easily and you will get your cataphoric obtunding in very much less time. I add some of the morphia crystals to the cocaine solution.

I consider the use of the milliampere meter a great essential in the administration of electricity. I believe, as Dr. Ames has said, that it is almost impossible for us to tell the amount of current a patient takes without the use of the meter. At present I use the 110 volt Edison current, and can turn on the electricity to its full extent, but you get no result until the patient gets into circuit, then you can see the difference in the adaptability of the patient's condition to the current by the movement of the milliampere meter. I have noticed its effectiveness perhaps more between one and one-half milliamperes. Let the indicator remain where it is and you will see a sudden change in the milliampere meter, you will then know the patient has taken the amount

of current indicated. In other words, the current has increased in their body and they have taken that much more current than the amount previously shown, without having moved the rheostat.

Dr. WOOLLEY: What I have got to say I hope you will take seriously. It dates back a little in my experience with cataphoresis. I recollect quite a little while ago, while operating for a patient, that the teeth were hypersensitive, and the patient was a man who so manifested his feelings in regard to the pain that I dropped my instrument and went back of the chair, with a strong feeling of disgust, although it was not manifested at all. Immediately the patient said, "Dr. Woolley, what are you doing?" I said, "Nothing," and I went back and commenced to operate without the least particle of pain. That instrument cut into that dentine freely and tamely.

Now, to come back to cataphoresis. We operate on the teeth painlessly in a majority of cases. Sometimes the cotton becomes dry, the patient gets it into his head that the electricity is working, and when we get through we worked painlessly. Now, I wonder in a great many cases if autosuggestion has not something to do in rendering the cavity painless when operated upon. Now it seems to me that there is a time coming when we will be able to so control our patients in the way of autosuggestion that will do away with cataphoresis. But it seems to me there is a field of study in the direction of the cause producing the conditions that have been found in the gum, where the gum is sucked away and caused a great deal of injury, the question is, what is the cause of that. Whether it is the passage of the electricity into the gum, whether it is using the wrong end of the instrument, or using the negative instead of the positive pole by mistake, I would like to know what the cause can be. I would like to know if Dr. Ely has investigated in that direction.

It seems to me that there should be a study in the direction of how far the paralysis or obtunding should go. I think I mentioned it some time ago in a case that I had in the removal of a live pulp, that at the end of the canal there was a slight sensation, but no pain in the removal of the pulp.

Dr. SCHWARTZ: A few weeks ago I got a cataphoric outfit, furnished by S. S. White. It is a McIntosh rheostat, 114 cells, American storage battery, that I understand has just recently been fitted up for that form of cataphoretic work, and they have all

talked about how to do this painlessly, but I had a few cases where there has been a great deal of pain in turning on this current, and I thought perhaps I was doing it too fast and I was crowding it too hard, or I go too slow, and it is always on these hypersensitive cases that I want to do things painlessly, that some one says, "Cataphoresis is a constant pain; it is not so severe, but it is a pain I do not like." Now I would like to hear from some of the gentlemen in regard to the matter and also in regard to the time. Ordinarily I cannot get cataphoresis short of eighteen minutes. I have not had more than one or two cases that I have had cataphoresis that worked painlessly short of eighteen minutes, and in a good many cases more, and I have had some cases where I have applied the cocaine to the pulp directly, and I was positive that I did not have the poles changed; I also looked to see that my switch was turned on and all those things that a man is likely to forget in some cases. I think as Dr. Ames has said and also Dr. Perry, the milliamperemeter is an absolute necessity, because you are in the dark without any lantern at all when you try to give the current without knowing how much your patient is getting, or anything of that kind and I think that all who can should have a milliamperemeter.

DR. PRUVN: We have had a little experience with cataphoresis; we have had some successes and some failures. We have found the necessity for the use of the milliamperemeter. Our plan is to place in the lap of the patient the volt meter and the milliamperemeter. They are both attached on one board so that they can be placed in the lap of the patient and the patient instructed then how to turn it on, and we have found much less difficulty and much less pain in this way. The patient has hold of the crank that turns and he turns it gently or vigorously as he wishes, and in this way the pain is very little from the application. Not only that, the mental power I suppose plays quite an important element, because if the patient is dreading every minute that he will be hurt it affects his nervous condition, but if he is under his own control, he has much more confidence and has less fear and less pain. We find the milliamperemeter of great service in those things that have been suggested by one of the speakers. I remember a case I had Saturday, where a patient applied the current and ran it up to thirty-five volts with no pain, ran gradually up; the milliamperemeter showed only about one-fifth of the volt

meter, thirty five volts, so it shows the uselessness of depending upon the volt meter; you simply cannot tell from that at all the amount the patient is receiving or the amount that the patient can take, for the ohms of resistance in one patient are different from those in another. So we find the milliamperere meter of service in telling us what we are doing. We have the cells and we are sure that we have sufficient current and we are sure that we will not get some of the unpleasant experiences that we had with the hundred and ten volt system, the electric light system. So we find it is a good thing, but like all good things must be used with care. The insulation of the parts is a question that needs to be handled with perfectness every time. The parts must be perfectly insulated; there must be no possible connection with any metal, whether it be a clamp or filling material in some tooth or any other matter; there must be perfect insulation.

Dr. FERNANDEZ : I would like to ask Dr. Ames what kind of clamps he advocates?

Dr. AMES : I do not use any, I get along without.

Dr. LOUIS OTTOFF : I have noticed the same thing spoken of by some one as to the uncertainties attending the use of cataphoresis, and hope, that some day that point will be cleared up. I remember one case distinctly where I supposed the current was escaping somewhere, and I did what Dr. Ames has done, that is, I took off everything and isolated a single tooth, then placed over the tooth a piece of rubber tubing so as to make it absolutely water tight, and then applied the holder, turned on the current for something like forty minutes without any result, hence it appears that there must be cases when all steps have been taken with care, and the patient can feel the current, yet no effect was caused by it. There is some reason for this, which is beyond our knowledge at present.

I am surprised at several remarks that were made in regard to the possibility of applying the wrong current to the tooth, the negative instead of the positive. Taking the wrong bottle off the shelf is just as excusable; there is no excuse for such errors. A man must be very careless if he is at work on a living patient and discovers that he has the wrong current on. When I use the electric current I am wide awake and I know what I am doing.

One great benefit that we derive which has not been mentioned in the use of cataphoresis is this, that without auto-

suggestion or anything of that kind, the very fact that the patient has rest for ten, fifteen to twenty minutes is of a soothing character, and my practice is to wheel the chair around so that the instrument stand and the electric engine and all that sort of thing is out of sight, and either a view from the window or some picture is secured. Sometimes if the apparatus or current does not affect the patient, some may get good results from the fact that the patient has had some minutes' rest and understands that something good is supposed to be accomplished.

Dr. H. A. CROSS: I wish to make a little explanation regarding this patient in the case in which I was not successful in the use of cataphoresis. On a previous occasion I devitalized the pulp in another tooth in the same mouth, and I found that there was great difficulty, though I devitalized that by the use of arsenic. I find that a very few of my patients do not seem to be susceptible at all to the action of arsenic; I do not say not at all, but very slightly so, so much so that I am annoyed very much in treating such patients. Perhaps about one-fourth of one per cent of my patients I find in that condition, and this case where cataphoresis did not work is one of that class.

Dr. F. B. NOYES: One word in regard to what Dr. Woolley spoke of as to the cause of the sloughing of the gum and the damage spoken of as resulting from cataphoresis. I would quote the suggestion that Dr. Black has made in that regard, namely, that it is well known that the poisonous effects of microorganisms are due at least in a large degree to toxic substances, which are the result of the decomposition of the bodies of the organisms. If these substances are carried in the current they will cause the death of the tissue wherever they are carried, and consequently if you turn the current into a cavity without removing any of the debris, you have in that debris the bodies of microorganisms, you have perhaps around the neck of the tooth a collection of microorganisms, your current may decompose the bodies of these microorganisms, and may carry those toxic substances down into the tissue and kill it wherever they are carried. I have had no experience with cataphoresis, but the suggestion that Dr. Black has made has seemed to me a caution, at least, in the application of it.

Dr. H. A. GUNTHER: Relative to the interchange of poles when using cataphoresis, it seems that there might often be a cause for that; suppose we change the connecting plug from one socket

to another in the same room, the polarity of the wires may not be the same. Where we do not have a milliamperemeter to test the character of the poles, one of the simplest ways to proceed is as follows: Make a stock solution of iodide of potassium, spread a small portion of this on a card and place both electrodes on the moist spot; iodine will be liberated at the positive electrodes.

J. G. REID: There is one point that I have had a little experience with and accidentally found out, so I think I had better speak of it for fear it might be overlooked. Speaking of insulating the tooth perfectly, insulating amalgam and gold fillings, insulating clamps, you have not said anything about insulating the patient in the chair. Now this is decidedly important. You get some very unpleasant results sometimes by the patient just simply having a foot on the foot rest of the chair, especially if the bottom of the shoe sole is a little bit damp, coming in off the wet street and putting the foot on the foot rest while you are using the appliance. I have observed this unpleasant feature a few times and it stumped me very seriously until I found out by trying it myself, wetting the sole of the shoe, for instance, and putting it on the foot rest and a very decided shock has occurred, so that I insulate the patient from coming in contact with any metallic part of the chair, thus preventing short circuiting, and especially the foot; and since that time I have not had any unpleasant results in the application of the current.

Dr. Keefe, in his remarks before the Odontographic society, said a short time ago that a short circuit could be averted by carrying a wire from the negative pole to the radiator. In doing so it would relieve any unpleasant condition caused by the patient touching either the iron side of the chair or the iron on the foot rest.

Dr. W. V.-B. AMES: This running of the negative pole to the radiator may work all right in some kind of apparatus, but I know it will not work with Dr. Reid. I happen to be using the same kind. His negative pole is a dead wire; it is simply a ground wire of the Edison circuit, and running your negative wire to the radiator would not do a bit of good; your instrument has to be re-wired.

I spoke of putting myself absolutely on the safe side. I say re-wired, not re-wound. The wiring on the apparatus, for instance, has to be changed so that the entire resistance of the

apparatus is between the power and the patient, which will enable you to carry the negative to the radiator or to the negative wire or the dead wire of the Edison circuit, which amounts to the same thing, simply a ground wire. You will have to re-wire your apparatus. I cannot explain without the blackboard, but I think the most of these cataphoric outfits are wired in such a way that there is a chance of cutting out part of the resistance by the patient touching a water pipe or gas pipe, or any part of the chair to which it might be connected. There is a way of wiring by which you can avoid that.

Regarding this matter of getting results with some cases and not with others, I think there is always an explanation, and when the gentleman speaks of not getting results in a case which seemed exactly similar to another case in which he did, there must be some explanation. I think in Dr. Cross' case it was calcification of the pulp tissue. I find in cases where there had been extensive calcification, there is great resistance. I think Dr. Ely will bear me out in that. In this connection the gentlemen will find the milliammeter of great service. They will find that not getting a current is the reason they do not get a result.

A MEMBER: It is always possible that the water in the cuspidor carries the current and makes a short circuit.

Dr. FERNANDEZ: It is a very easy matter to keep the hands of the patient from the cuspidor, but the difficulty is to keep their feet away from the metallic foot of the chair, if the chair is connected with the iron structure of the building. Pure water does not carry much electricity.

Dr. W. V.-B. AMES: The very impurity of the water in this tube from the cuspidor would offer much less resistance than other parts of the apparatus. That moisture would carry more current than other parts of the apparatus. The fine platinum wire or the graphite in the cataphoric apparatus would offer more resistance than that water does.

Dr. E. MAWHINNEY: I rise to mention a little experience I had, which has occurred to me just now. I used to have a great deal of difficulty when I wished to apply a little additional moisture to my cotton, in that as soon as I touched the chair with my foot or touched the patient with my hand, the patient would jump. I have learned a new way of applying it. I apply my additional moisture by a little Dunn syringe, just take it up and let it drip on

the cotton. The shock is not due to adding the moisture, but it is due to my having some electricity by me somewhere and in taking the metal pliers, taking up the moist cotton, I make a connection between the electricity in myself and the electricity in the apparatus, but if you take a little Dunn syringe and drop the moisture on that and lift your cotton, you will have no trouble.

Dr. ELY: Some of the points that have been mentioned I would like to call attention to. I think the current is very frequently broken and makes a shock at the opposite electrode that is held on the cheek or in the hand. I never allow a patient to have control of that; they are always relaxing hold. It should be fastened either to the hand or on the cheek. I place it now under the rubber band and I find it a good method, as the contact is never broken.

Clamping has been spoken of. I have tried these extra appliances and they take time. Now, in clamping teeth, or in operating on a tooth, I go ahead until it is time to apply the current, just as I always do to prepare the tooth for filling. I do my clamping in the right place, taking no chances on that. Then I insulate the clamp by gutta-percha; it is done in half a minute; it makes a perfect nonconductor and can be applied instantly, and if necessary to remove afterward it is done very quickly. It is a perfect insulator; it requires no extra appliance, no extra clamps. In dampening the cotton I had the same trouble that our secretary had, and I avoided the same by insulating my pliers. I always add moisture to the cotton by dipping my cotton in the moisture; that frequently produces a shock and by simply insulating the handle of the pliers, cutting off connection between yourself and the patient, I find I can avoid that in all cases.

With reference to this forty-five minute exposure and failure to anæsthetize the pulp, I have had those cases, and I think in most of them I found the cause. There are two causes that are very obstinate to the effects of cataphoresis. One is where the pulp is highly inflamed. The first time I tried it and failed I used it for forty-five minutes, and it was a total failure, and I thought I had struck one thing the current would not handle. But since that time I have used it on four or five pulps of that nature and succeeded in every case by cutting down the current, giving it one-third the speed and allowing ample time. If I can get an inflamed pulp out in an hour and one-half and avoid application of arsenic,

I think it is a success. I do not use it often that long, but in four or five cases I have done it and completely anæsthetized those highly inflamed pulps.

Where you have calcification of the pulp it is just as hard to handle. I once worked for an hour on a pulp, and at length succeeded in opening it and then found a large calcification of the pulp, which I removed. Twice I have found a condition of that kind, and I think it is specially hard to affect.

I have not used the milliampere meter, simply because I have not got it. I get along without it. I started along with an apparatus that I made myself, but I can endorse all that is said about it. I think we ought to have it; it is essential in one sense; we ought to know what we are doing, although I venture along without being equipped with it.

Regarding the effect on the gum structure of the tissue, I never had any experience with it; I believe it is the result of my being especially careful about insulating the gum, keeping the current from passing into the gum. I think it has been proven for a long while that any high current passing for a long period will produce sloughing of the tissues.

One point that has given me some trouble is in bicuspid and molars, the insulating of the cavity where you have a large proximal filling immediately adjoining the cavity you want to fill. I now do it by completely covering the adjoining filling with gutta-percha. In some cases I take a thin sheet and force it right down, holding the cotton in place.

In regard to testing the poles, I got tired of mixing the iodine and all that kind of business, and I do it now with plain water. Take the two ends of your wire, turn the current on your full limit, turn it on strong, put the ends of the wire in water, hold them there half a minute and the negative poles will give off bulbs. The two ends of the wires should be the same metal. If one of the poles is copper and the other is platinum, that test will not answer, it did not with me; but if you take the two ends of the copper wire you will get the negative pole instantly, simply by the bulbs.

Dr. PRUYN: I have heard of trouble regarding injury to the skin of the patient at the negative pole. I have not had this experience, but I would like to ask if any one having used this

apparatus, has had this experience. I think an irritation of the skin at the point of the application of the negative pole or sponge.

Dr. ELY: I have had nothing serious. I have had in the last two months, since I have begun putting the electrode here, two patients where there was a decided irritation, and on their returning several days later there was still evidence that the outer tissue had been destroyed. By that, I do not mean any marked defacing of the tissue, it was almost imperceptible, but you could see it curling up just slightly. In another case I had some little burning from a ring, it was nothing serious; it was almost a blister, and I think, probably, if it had been one of those long operations where they had the current on for forty minutes, it would probably have been a serious trouble.

Dr. J. H. PHOTHERO: I remember a case that came under my notice about a year ago, where the electrode was placed under the rubber dam holder, it being allowed to remain there nearly twenty minutes, and when it was removed there was a mark the size of the electrode, about an inch and a quarter in diameter, while the tissue under the center of it was burned almost an eighth of an inch deep. It was more decided than a blister and a scar was left, the wound filling with cicatricial tissue and requiring about eight weeks to heal.

Another case where the electrode was held in the hand a blister as large as a quarter was produced in the center of the palm. The patient was a lady with very delicate skin and perhaps was affected more readily than others.

Twelve or fifteen cases have come under my notice in the last four or five months in which serious results have followed the use of the cataphoric appliance, and my faith in its utility has materially decreased, so much so that we have practically discontinued its use. There may have been cases where the teeth were not properly insulated, but serious results have followed where the insulation has been successfully accomplished, the current apparently passing through the tooth substance to the peridental membrane, causing its partial destruction. In some instances no clamp was used and the cavity did not extend to the gingival margin, yet destruction of the tissues followed. Frequently no pain was experienced by the patient during the application of the current, while in others a slight burning sensation was felt, and in a few instances acute pain was felt from the first application of

the current. In one case the application was made to the lingual surface of the central incisor. The cavity did not extend to the gingival margin, no clamp was used, the rubber dam had been properly applied and free from contact with opening in the tooth, very little pain was experienced by the patient, and yet very serious results have followed. Necrosis of the alveolar border in the interproximate space has occurred. The central and lateral are both extremely loose. The necrosed process has been removed and there has been a considerable amount of soft tissue destroyed. The chances are largely against being able to save the two incisors.

There is a factor in the handling of the electric current for cataphoretic purposes that I do not think we realize as forcibly as we should, and that is the great difference in the amount of resistance to the passage of a current through the body in different individuals. We have no means of ascertaining just how much current can be applied without doing injury to the tissues. We can measure the amount of current that travels through the body, but in the very act of measuring we may have gone beyond the limit of safety and produced disastrous results. Some patients can withstand thirty-five to forty volts and scarcely feel it, while others cannot bear the application of five volts without acute pain, and any attempt to increase the amount only increases the pain.

We have been using the one hundred and ten volt current in conjunction with two well known forms of cataphoric apparatuses. They are kept in good order, having been returned to the manufacturers several times to insure their perfect condition, and yet serious results have occurred in some instances where all known precautions have been taken to avoid any accident. Lately I have been able to detect teeth on which the current has been applied even though I was not actually aware of its use. I cannot do so in all cases, but it is possible in some cases to see the effect of the current from the peculiar recession of the gum at the gingival margin.

Dr. J. H. WOOLLEY: I would like to ask Dr Ely a question with regard to whether he makes any discrimination in regard to the age of the patient?

Dr. ELY: I make no discrimination whatever. The patient controls the current, he can stop it at the slightest indication of pain.

I was to close the discussion and so I think that some further remarks are in order. The last speaker has given the most remarkable record that I have ever heard. I do not know how he administers the current, but I will frankly say, after all the experience that I have had, that if serious results should follow I certainly would blame it upon the method of administration. Such destruction of tissue and such action is absolutely impossible, I believe, under proper conditions. Understand, I am not saying that it is impossible, but if that had happened when I was using it I certainly would have felt that I was overlooking something, that it was not properly insulated, that it could not happen any other way.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

Regular meeting held September 13, 1897, Dr. George B. Perry in the chair.

Dr. G. W. Schwartz read a paper entitled "Art in Dentistry."

DISCUSSION.

Dr. ROBERT GOOD: I have listened with much interest to the paper of Dr. Schwartz, and I do not know of much to discuss, because I think as he does in regard to porcelain work and many other things in dentistry. I have been doing porcelain work for the past year and a half. I have also followed a line of practice that I learned from Dr. Younger, and I have not heard any one else speak of it before. I have made some natural inlays, that is, I take a natural tooth and cut it down instead of using porcelain. I have also done some implanting. I think as Dr. Schwartz does with regard to crown and bridge work, namely, that if we want to be up to date we have to do porcelain work. I think it is the coming bridge. If it is properly made, it is stronger, cleaner and much more artistic, which is something to be desired in everything we do. Undoubtedly a great many have had failures in doing bridge work, and I must confess that I have had some myself, but it was because I did not do my own work right to begin with. I think that I know now how to build a bridge that will stay.

Dr. J. H. PROTHERO: The essayist has said that one of the most essential points in our work is to have a clear conception of what we wish to do, and then be able to reproduce it. We must

have a definite idea of a tooth if we wish to reproduce it. We must get firmly fixed in our minds the grooves of a tooth, and then educate our hands to reproduce it in whatever material we select for this purpose. If we are working in clay, and carve the cusps in modeling compound, to reproduce the model, we must know how to carve the lines so as to obtain artistic results. This is particularly desirable in porcelain work. In building crowns we usually have dies prepared from the natural teeth or carved in the conventional way to represent the natural forms of the teeth. In porcelain work we depend upon the anatomy of the tooth, and we must know how to do this with our hands. There is no better way of educating a dentist to do this work than by using models.

I feel that this is a good paper. The author has touched on some points in which we are sadly lacking. In a great many cases we neglect the little details that amount to so much, and this neglect is largely due to being in a hurry. We want to cover so much ground. I feel it is strict attention to details that makes up the sum and substance of good work, and if we slight the details we cannot expect to do artistic work.

Dr. W. H. FOX : A word or two in regard to modeling teeth according to the forms laid down in Black's anatomy. For at least two years at the Chicago College of Dental Surgery, manipulative ability has been cultivated in developing tooth forms in carving teeth from toothbrush handles, etc. If Dr. Tenney were here he could probably give this process at length. Much of this work has been creditably done.

Dr. SCHWARTZ : I said in operative technics we had already received valuable instruction, and the work of carving from toothbrush handles and so forth comes under the head of operative technics. It is a good drill for men who are engaged in this line of work, but it is easier to take clay and manipulate it than it is to sit down and whittle bone. Men who have not gone through this work of operative technics will find clay a much easier material to work on than to cut a toothbrush handle. In all of the dental colleges in the city we have good men who teach operative technics, and those who have learned to carve for fillings will find it to be invaluable to them in porcelain work, just as much so as modeling in clay.

Dr. J. W. BIRKLAND : I do not think I can add anything to what has been said. I was one of the members referred to by Dr.

Prothero as having done considerable carving in clay. We had Black's anatomy, and a large assortment of teeth, from which we selected the tooth we wished to model. We criticised each other's work as we went along. The carvings were passed around and criticised. In this way I derived a great deal of benefit.

Dr. PERRY: In reproducing your work in clay, it was a mental photograph of the model in front of you, and you did not go by accurate measurements?

Dr. BIRKLAND: Yes.

Dr. SCHWARTZ: I wish to say that porcelain work, while it occupied a conspicuous part in the paper, was not the only subject dwelt upon. I also referred to the regulation of teeth, which was one of the most important points in the paper. I would like to hear more in regard to filling and regulating teeth that ought to be attended to before we use porcelain; in other words, I would like to hear the phase of artistic dentistry discussed.

Dr. H. R. SACKETT: I do not know that I have anything to say that will be of interest to the society. I wish to remark, however, that I have been giving considerable attention to regulating, more especially according to Dr. Younger's plan. He has given me some excellent ideas in the way of regulating, and I am trying to put them into practice, and so far as I have gone am very well pleased with his method of regulating teeth with silk ligatures. I have been using this method for four months, and the longer I use it the more expert I expect to become in putting teeth in order artistically without the use of gold bands which have been an annoyance to me in many instances.

Dr. F. E. ROACH: I regret that I did not get here in time to hear Dr. Schwartz's paper. However, I heard a portion of it, and knowing what I do of Dr. Schwartz's work in porcelain, I know he is an artist in that special work, and I heard enough of his paper to get an idea of his work outside of porcelain work. I have been devoting a good deal of attention to bridge work, and while it is not altogether porcelain work, I feel that it is a near approach to it. But I shall not make any attempt this evening to speak at length on bridge work. I would like, however, to emphasize one point, namely, that it is our special duty to our patients along the line of art in dentistry to educate them to recognize artistic work when they see it. Too frequently we see large, glaring, imperfect gold crowns in front teeth that are wholly

unnecessary, and when people come into our offices it is very hard sometimes to talk them out of it. I think it becomes us to educate the people to an appreciation of artistic work, and I believe the day is fast approaching when they will appreciate and demand it, and the dentist who does not practice artistic work will not have a very lucrative practice. I myself believe that porcelain work is the coming thing, and it is only a question of time when we shall do more of it than at present. At present it is beyond the power of the general class of dentists, who are not educated in the manipulation of porcelain, and it is out of the reach of the majority of our patients, who cannot afford the expense attached to porcelain work, consequently we must do the next best thing and get along with the methods that we at present have, and avoid, as much as possible, a display of gold and the unnatural features of our work.

Dr. D. M. CATTELL: The essayist has told us that one of the first requisites of the dentist is to restore lost portions of the teeth. I think the *ideal* requirement of the dentist is to *prevent* loss. The prophylactic treatment is the first important point. In the future great things are expected in that line. Carving seems to be an interesting idea whether modeling in clay, bone or other substance. It has been known for several years that students may study dental anatomy from a book by the day, the week, the month, and still not know very much about the subject. Study until the small hours of the morning and learn what they can from the text about a tooth, and yet when they come up for examination they fail. The little points of information they have acquired by memory have disappeared; they cannot remember the "landmarks;" nothing has been placed before their mind's eye sufficient to hold the attention long enough for a picture to be properly printed thereon. Students have tried for a considerable time freehand drawing. It helps wonderfully to fix the attention of the student on a certain point, but when it comes to moulding a tooth in clay, or carving one in ivory, it is a greater benefit. When a student, be he old or young, takes a piece of clay and with a form before him, whether it be one face of a tooth as in a picture, or the tooth itself as a model, and carves and moulds the clay into something resembling the model before him, he will have retained in his mind some of the interesting "landmarks" made by his own hands. He has produced it by his own craft, and in doing so he has worked on the same lines that they do so success-

fully in the idiotic asylums and manual training schools he has trained his fingers as well as his eye and mind. The mind will follow the act of the hand more readily and retain an image of what the hand has done in its memory more distinctly than if it simply sees and does nothing toward building, so that in building up or in shaping with the hand, the retention of the mind of these particular points is much more vivid, and has not only a "bird's eye" view of it, but a decided and more permanent impression made there that the mind is not likely to forget. How many years since did it become the custom in dental societies to have a blackboard? Some of the older members can remember the time when if a blackboard was talked about by any one he would be laughed at, and members would express themselves as not wanting grammar school work here. Now, we have a blackboard and by means of different colors of chalk we can complete a picture which the audience can see and understand what the speaker intends to convey. A few years ago we could not do this. To-day by means of the blackboard we can draw the picture of a cavity, with a deep recession or undercut, construct an angle or cut a step that any of us would know the significance of. Freehand drawing should go with the instruction in modeling. There have been few exhibitions where clay has been brought before the dentists publicly. There is to be an exhibition of moulding teeth in clay at the next meeting of the National Association of Dental Technics by one of the greatest clay workers in our profession. This will surely be an interesting sight. If Dr. Schwartz had brought a little clay with him, gotten up here and demonstrated how modeling in clay is done, I am sure we would not have forgotten a word he said. Now, much of what he has said will slip from our memory. If he had done this before us by giving an actual demonstration we would have all been benefited by it.

Dr. THEO. MENGES: I have nothing particular to say upon this subject, although I wish to emphasize one point that has been brought out in the discussion, viz., that we should have a clear and correct conception of what we wish to produce. I incline to the opinion that if we were to call upon the dentists here this evening to give a correct normal occlusion of the teeth, surprises would be in store for us. I doubt whether there are three in the room here this evening who could do it. It is one of the most difficult and yet one of the most necessary things to understand.

After we have a thorough conception and understanding of normal occlusion we have accomplished a wonderful amount in possibilities leading to artistic dentistry.

I would find fault with one or two expressions that have been used this evening; for instance, it was said "in the modeling of teeth we are led to understand their anatomy." This I think to be a faulty statement, we learn their forms not their anatomy, we should be more careful in the expressions we use. We learn, in modeling, the contour of the tooth, but when we come to the anatomy of the tooth it involves much more than is embodied in the modeling process, in fact we get a very small portion of the anatomy of the tooth by the modeling process. I would make one more criticism, it was stated, "in the modeling process the hand performs and the mind grasps." I think this to be erroneous. Everything that is produced by man is the realization of an idea. You must first have the thing clearly formed in the mind; after it is formed and fixed in the mind then the hands can be educated to produce in material form the thing conceived.

Dr. CATTELL: When a child reaches out its little hand does its brain thought precede the movement?

Dr. MENGES: Yes, every time.

Dr. CATTELL: In the asylums that I spoke of, if they take an imbecile to broaden his mind they do not give him books. If his mental caliber is nil, he has first to learn to do one thing at a time with his hands, and these are made to move in certain definite lines, time and time again, until the action has become a habit with the muscle. In the continued manual training of that individual the mental window is slowly opened, so to speak, and the subject becomes sufficiently conscious to know what he has to do, and so the work goes on. This idea has been worked upon and thought out by professors and teachers in these asylums until it has become an established fact that the mind follows the hand or muscle action.

Dr. GOOD: If the child did not have brain, would it extend its hand?

Dr. CATTELL: A child or any other animal with a brain will do many things owing to instinct. At the same time the child's mind or reasoning faculties may not be developed sufficiently for it to know that it was going to put out its hand. Does the child, or the calf, or the puppy think before it takes the nipple of its

mother for abstracting nourishment? Does the animal have thought of what it is going to do? Is its mind developed sufficiently to reason on the matter?

There is quite a difference between instinct and mind or reason.

Dr. ROBERT GOOD: Speaking of artistic dentistry, if there is any one here who has any doubt that it wont pay all of us to carry it out in our work as much as possible I think it would be a great benefit for him to visit Dr. Younger and see some of the work that he is doing. To my mind he is the most artistic dentist we have. I have seen some of the work he has accomplished for patients who had previously consulted a dozen or more dentists, and they were told nothing could be done for them. He has worked in their mouths and put their teeth in a condition that is as near perfect as it is possible for a set of teeth to be. He did it all with silk ligatures, pulling the teeth affected with pyorrhœa in position, lifting them back and in place and straightening them out. He makes his art in dentistry pay him.

Dr. Schwartz has told us that a great many dentists do not follow out the artistic ideas that they really possess simply because they cannot afford to do it. To my mind there is nothing that will pay us better than to be artistic in everything we undertake. Personally I polish every filling I put in the mouth. I do not care what it is, and I make my patients pay for it. I give them to understand that it is necessary that it should be done, and that is the reason I do it. When patients understand that you are working for their benefit and not your own they are willing to pay for what you do for them.

Dr. H. A. CROSS: I wish in this public way to say something that will be an encouragement to Dr. Schwartz. I have been quite intimately associated with him for more than a year. Some of you are doubtless familiar with the work he has done in my own mouth, and I am glad to testify to its artistic effect and its value. I refer to the porcelain bridges he has made for me.

I must confess that in finishing fillings I have been a little careless about shaping them, particularly those that I have in mind—amalgams. I have gotten some excellent ideas from Dr. Schwartz with regard to shaping amalgam fillings so that it will restore the lost portions of the teeth to their natural contour. I have noticed an improvement in my work since adopting the ideas

I received from Dr. Schwartz and from having porcelain work done in my own mouth. I have graduated from gold bridge work and making gold crowns. I have discarded that kind of work from my practice, and introduced porcelain work in its stead. I am a little inclined to follow out my own ideas, and I wish to speak of a certain style of porcelain crown that I am making. I understand that Dr. Schwartz has done something similar.

I had a case last spring in the mouth of a young lady for whom I was doing some work. It was the root of an upper bicuspid decayed away up into the socket over one-quarter of an inch above the gum line. I told the patient that I would like to try the experiment of making a porcelain crown for that root, and that if I should not succeed I would make no charge for my efforts. I cleansed the socket in the gum with hydrozone, then pressed warm gutta-percha into the socket to crowd the gum away to give me a view of, and access to, the remaining portion of the root which I found to be very short, it being decayed far up into the socket, too short to band or crown in any ordinary way. I then took an impression with modeling composition, reproduced that in metal, made a die and counterdie, and swaged a platinum disk which fitted the end of the root and extended down nearly to the surface of the gum. Through this disk I passed a platinum post extending it up into the remaining portion of the root, and soldered the post to the disk with pure gold, and to this disk and post I constructed a porcelain crown, baked it, and set it with cement. The result was the restoration of the lost member with a crown which exactly matched the neighboring bicuspid. I saw the patient a few days since and made inquiry regarding the crown. I said to her, "What have you done with the crown?" She replied, "I have it yet. It is fine and all right."

After this successful experiment of making a porcelain crown for a root that I have always regarded as past salvation, I made up my mind that I have in the past extracted a good many roots which might have been saved. In dealing with these short roots which were decayed far beneath the surface of the gum, we of the dental profession have been in the habit of saying to our patients, "It is very unfortunate, but we will have to extract them as they are too far gone to be saved," which necessitated making a bridge which was expensive, or by making a plate which was far worse practice. Since making the porcelain crown for the patient just referred to, I

have made one for another patient which is so firm and natural looking that I do not think any gentleman present would suspect its being other than a natural tooth if he were to inspect the mouth of this patient without an intimation of there being any artificial crowns in the mouth. In this case it was an upper cuspid root which had decayed fully five-sixteenths of an inch above the surface of the gum. In making these crowns for short roots I make the disk so that it does not come quite to the surface of the gum, so that when the crown is completed and set to place, the gum comes in contact with the porcelain all around, thus hiding the metal disk at all points.

Dr. G. V. BLACK: The artistic features of dentistry are always interesting, and I might say a word as to crowns, the subject matter that has just been related to you. I am in the habit myself of saving roots that have been broken very low, and while the gentleman was speaking a case came to my mind where the crown of the upper cuspid was all gone, the root hollowed out, and the gums grown into it as he remarked. I looked the matter up only a few weeks ago, and it is twelve years ago that I worked on that case. I crowded the gum back, found a thin shell in the lingual, constructed a porcelain tooth something of the usual form with gold band, the only portion of which could be made effective, but I made it fit where the tooth had been formerly upon a labial, and extended it to the root, not over it, because I could not get as good a fit as possible in this way. I extended the post under the remaining portion of the root, giving me a better opportunity, and mounted the crown with cement. The last summer the crown moved for the first time; the patient was a near neighbor and ran in to ask me if the crown had not moved, and on examination I found it had. I had some trouble in trying to remove it; the platinum pin had been bent by some severe usage, allowing the tooth to move. I got away the pin, made three wires, and soldered it together with gold and platinum and reset the same crown in the same position and in the same way with this pin, which was much stronger than the original pin, and it is doing excellent service to-day.

So we may, if we are careful in selecting our cases judiciously and in operating carefully, save very many of these roots that are being condemned, making and mounting useful teeth upon them, whether it be porcelain or gold. I think gold still has a place. We

should not turn our attention exclusively to porcelain, but each of us perhaps will succeed best along certain lines that seem most adaptable to our particular hand, so that I would not condemn the use of porcelain by those who are artists in this work, neither should porcelain workers condemn the use of gold by those who are artists in gold in crowning and bridging. My notion is that good crowns and bridges can be made with either material.

As to the finish of fillings the profession has been very lax, and particularly as to the form of fillings, the form of the restoration, particularly that portion of it relating to the restoration of the interproximate space. I have talked about this before in your presence and do not intend to enlarge upon it this evening. But this is as important with amalgam fillings as it is with gold fillings, and let me say to you, gentlemen, it is as important in making crowns as it is in making fillings. We are meeting with crowns continually that are well formed and well mounted, but the preservation of the interproximate space has been neglected, and the crowns become failures on that account. Food lodges between the crown and a tooth on this side or that, the gum is pushed away, made sore, becomes irritated, the interdental membrane of the tooth becomes diseased, and the tooth is lost on that account purely from neglect in preserving or maintaining proper form of the interproximate space. It is here that art in dentistry in those cases is to pay you. It is an important matter in all our work that we properly protect the soft tissues between these teeth, and these are protected by getting proper form to the contact of the teeth one with the other, as well as proper form to the interproximate space.

Something was said just as I came into the room in regard to the mind of the child. Well, as I grow older and observe more I am inclined to attribute more to mind and less to instinct. We find in many animals actions that we cannot ascribe wholly to instinct, yet they are governed perhaps in some degree by instinct. I remember distinctly seeing a child throw up its hands and scream the first time the clock struck after it was born. It was in fright at the striking of that clock. Maybe you would term that instinct. The next time the clock struck there was some fright, but the third time it failed to frighten the child. Was that instinct? Not entirely, I think. There is the instinct of self-preservation perhaps that often runs away with the mental faculties.

Dr. SCHWARTZ (closing the discussion): I thank the members for their kind indulgence in listening to what I have said. I was a little surprised that there was not more said in regard to the restoration of the interproximate space until we heard from Dr. Black. I got my ideas originally from reading what Dr. Black has written on the restoration of the interproximate space.

Another important thing I referred to was regulating teeth. I have not heard a single dentist touch on the importance of regulating, although I was in hopes that some of you would. I consider one point that I spoke of in my paper of great importance, namely putting the lateral incisors in their proper position. It is one of the easiest operations in the work of regulating.

Dr. Cattell said that the first requisite of a dentist was to prevent the decay of teeth. It is true, as he says, that the first requisite of a dentist should be to prevent the decay of teeth, and we are aiming to practice it; but the first requisite of the dentist of to day, the way we are practicing just now, is to remedy the decay in teeth.

Another point that was not touched upon, but was left open for discussion and gives the dentist a great opportunity to display his artistic ability, is the removal of deposits from the teeth in the treatment of pyorrhœa. Some men have gone so far as to say that the treatment of pyorrhœa will by and by become systemic after the deposits have been removed. That may be so. I am not scientific enough to say positively. I am not a pathologist. To remove those deposits on the teeth I consider one of the most artistic pieces of dentistry. I have heard Dr. Black say that the deposits on teeth become so obstinate and so aggravating that they were the most appalling conditions that confront the dentist of to-day. I had expected that this part of the paper would be discussed. I think there is a field open in this line for dentists to take up artistic work, and believe it is greater than it has ever been before.

INCIDENTS OF OFFICE PRACTICE.—DISEASE OF THE ANTRUM.

Dr. H. A. CROSS: I have a case in my practice which I think is of sufficient interest to briefly relate, hoping that I may get some light on the subject from some of the members present. It is a case of disease of the antrum. I extracted an upper first molar, the one that caused the trouble, and burred through into the antrum, made a tube

and before inserting it I cut it a little longer than I considered necessary resulting in quite a liberal discharge from the antrum through the nares, as well as through the opening made for drainage. In preparing a drainage tube I cut two slots lengthwise in the end of the tube that was to be inserted into the antrum, then cut the tube about three-sixteenths of an inch longer than would be necessary to reach the floor of the antrum, then placed the tube in position, having the slotted end passed up through the floor of the antrum about three-sixteenths of an inch, depending upon the slots as well as the open end of the tube for drainage, and secured the tube in position by tying it to the second molar. Having taken what I considered to be extra precaution in establishing good drainage, I have been surprised on each occasion when the patient has called for further treatments, which consists of syringing out the antrum, in noticing that there is some obstruction above the tube which prevents the wash from passing into and through the antrum until after I have passed a wire up through the tube, which comes in contact with a soft yielding veil, which is easily punctured by the wire. After puncturing this membranous veil I find no difficulty in forcing the wash with the syringe right through the antrum and out of the nares. The membranous veil referred to appears to be at some distance, say half an inch or more, above the upper end of the drainage tube, and I have been considering the advisability of removing the tube and inserting a longer one.

The question arises, if I insert a longer tube, one long enough to pass through the obstruction referred to, would I not endanger good drainage by passing the end of the tube so far above the floor of the antrum?

My first operation upon this patient was about a week ago, and she has been much relieved by the treatments which I have given her, yet I do not feel satisfied in having to use the wire every time in order to get satisfactory results from syringing.

I would like some ideas from some of the members present on this subject.

Dr. H. C. WEST: I have to thank Dr. Gilmer for an excellent suggestion he gave me in a similar case to the one reported by Dr. Cross, and that is, to make a longer tube than he speaks of by taking gold, slit the upper point all the way around, take a curved instrument, carry it through your tube, and burnish it down all the way around. It worked successfully in my case.

Dr. CROSS: Do you withdraw the tube, if necessary, to straighten it out?

Dr. WEST: It will come out of its own accord.

Dr. CROSS: Did you experience any trouble in closing over the tube?

Dr. WEST: In making the tube I used No. 32 gold, soldered a cap on the lower end of it of thin gold, cutting hole size of tube through cap after soldering, and used the finger to press it down over the margins, then slit the upper part, and that holds it so that it does not slip either way. The lady in two weeks could use it herself.

A MEMBER: How far did the tube extend up into the antrum?

Dr. CROSS: The tube extends sufficiently through to establish good drainage. It possibly extends 3-16 of an inch beyond the floor of the antrum.

Dr. WILSON: You say, Dr. West, that by burnishing down the upper margin you burnish it down to the floor of the antrum.

Dr. WEST: That is the idea exactly. Dr. Gilmer's suggestion was that after cutting slits around the tubes to burnish them we need to burnish them clear down to the floor, and this permits of free drainage all around the tube and makes a sort of funnel. If it extends about three-sixteenths of an inch it makes no difference, as the gold is thin enough so that the patient can remove the tube herself. In my case at the end of six months I succeeded in effecting a cure.

Dr. PERRY: What was the approximate diameter of the tube?

Dr. WEST: It is hard to tell the exact size, but I should say it was the size of a common slate pencil.

Dr. CROSS: I am using an aluminum tube.

Dr. WEST: I use gold, although it may not make any particular difference.

Dr. PERRY: Aluminum would be quite as good as gold on account of its elasticity.

PYORRHOEA ALVEOLARIS.

Dr. H. R. SACKETT: I had a bad case of pyorrhœa alveolaris come under my care, and I did not think that I was able to treat it effectively. I told the patient that the wisest thing would be to consult some one who knew more about the disease than I did, or else have the teeth out. They were in a bad condition, twisted,

pointing at all angles, some long, some short. I cleaned them as well as I could and took the case to Dr. Younger, who complimented me on the manner in which I had cleaned the teeth. When he saw the patient he said it was a simple case. He took the case in hand and invited me to come to his office as often as I could while the young man was undergoing treatment. I made several visits to the Doctor's office to watch the treatment. Every tooth is now clean, is straight and in its place, with retaining bands on them.

MINNEAPOLIS DENTAL SOCIETY.

DISCUSSION.

Dr. HARTZELL: First, I want to thank Dr. Owre for his able paper. It gives evidence of a great deal of research and careful thought. While I may not agree with him in all his deductions, I think, in the main, the ideas he presents in his paper are correct.

Prophylaxis, certainly—the prevention of unpleasant effects is far easier to accomplish than to remedy the conditions after they have occurred, and the old adage, “A stitch in time saves nine” was never truer anywhere than in the matter under present consideration.

I believe dentition is purely a physiological process and that the diseases usually attributed to dentition are due primarily to other causes. If the eruption of teeth is purely a physiological process, there should be no pathological manifestations and therefore, I think the diseases usually attributed to dentition are primarily due to constitutional troubles that may be inherited by the child from the parent or may be brought about by ill feeding. All the text-books I have consulted with regard to diseases of children place as the greatest possible factor in ill health of children, ill feeding—over feeding, under feeding, or bad feeding. Any child that is nourished properly and is fairly well, as far as can be observed, will go through the period of dentition without any of those pathological evidences that were mentioned in the paper. Therefore, I think the Doctor's idea of prophylactics is good. Take care of the children from the time they begin to take in the breath of life, in the most hygienic manner possible. Feed them with food that will be digestible, and contribute to the upbuilding of the teeth, and avoid the use of all indigestible articles.

I notice in the catalogue of diseases, he started with gastritis

and then followed right down the alimentary tract. I think he almost indicates there his own idea that bad digestion is the cause.

I don't know enough about the diseases of children to criticise the treatment brought out there or to add much to it; but in general, I believe the least number of drugs we can possibly use in the treatment of any disorder to which the human frame is liable, is by far the most wise plan to follow. If there are disorders and they are due to bad care or bad hygiene, to correct them by the use of drugs such as bromides or morphine or any of the sedatives is particularly objectionable in treating children, and baths and massage and all that sort of thing to be commended.

Dr. WRIGHT: I didn't know until Monday that I was expected to say anything about the paper; in fact, didn't know its title. I made a few notes and looked up in such text-books as I had some of the nervous troubles that are referred to as having been caused by dentition.

I want to emphasize a little what was said about the importance of diet. There is no question, I think, but that the irritation from dentition causes irritation of the gastro-intestinal tract, and there is no reason why the whole intestinal canal should not be irritated; the irritants that go into the canal in general are, I think, of a great deal more importance than those merely of the mouth. I think they have more to do with the irritation of the mouth than the irritation of the mouth has to do with them.

Undoubtedly some of the convulsions of children are caused by irritation from the teeth, but other things cause the same thing. External irritation will cause it, or irritation from any other cause. If the child is worried or tired or fretful, the irritation is the same and you get convulsions.

With a specific trouble we have retarded dentition. You have ill formed temporary as well as permanent teeth. I have looked this up a little and only find one man (Dr. Hyde) who refers to temporary teeth in syphilis as being deformed. Two other authorities that I looked up made no mention of that, but make mention that teeth are deformed, and lay it to irritation.

There are some other conditions of the body as well as irritation from abnormal dental eruption where ordinarily—if the child happens to be a boy—it will answer as well as anything, to circumcise it. Chorea is a nervous disease, and, I think, the only one where I can trace any relation with dentition. Out of 522 cases,

two-thirds occurred during the period of permanent dentition; but, during the time those cases occurred, a record was made of 110 post-mortems on choreic subjects and 100 showed pericarditis, where some 5 to 6 per cent showed nodulism in the base of the brain. It is a question in my mind how much effect dentition will have on the nervous system when we have that condition.

Rheumatism is supposed to be a cause of some of these troubles—rheumatism in parent or child.

Hysteria is not a nervous affection; it is practically a disease of daily life, due to mental or nervous strain rather than a physical change, although it is sometimes said to occur after an injury or attack of an acute disease, but it is not a physical condition. It occurs in women, principally, but sometimes in men and boys.

Tetanus is known to be a microbic disease; the germ is well known to us. In looking it up I find a nervous affection similar to it (called tetanus), that occurs in childhood in one, two, three or four forms, marked by slight spasms, particularly with the hands, with thumb raised and elbow fixed and head thrown back; it is similar to tetanus but it seems impossible that tetanus can be caused by erratic dentition.

About change of food, I cannot agree that it is indicated by eruption of teeth before the eruption of the molars. I don't believe it was ever intended that babies should use their teeth before the eruption of the molars—from one to two years, or any time when the first molar tooth begins to show itself.

Dr. F. B. KREMER: We would hardly find a child that would not show in the first three years of history, scarlet fever or whooping-cough, or some of those diseases.

Dr. ST. JOHN: A case came to me recently of a child having convulsions every day or two, and the physician attributed them to dentition. Another physician, a friend of his, heard of the case and he suggested that he had never seen a case of the kind where circumcision would not remedy that trouble, and that he had never seen a case where dentition was the cause. They spoke to the physician about it, it was circumcised and after that there was no further trouble. Their own physician, after examination, said it was very necessary to be done.

Dr. OWRE (closing): Dr. Hartzell started his discussion very correctly in saying that dentition is a physiological process; a point which I particularly emphasized in the beginning of the

paper. I spoke of the diet more in connection with prophylactic treatment than anywhere else.

Some of the German physicians make a great point as to the effect of the increased saliva, hence I mentioned it for consideration.

I think the tetanus referred in (I believe, Dr. Day's work on "Diseases of Children") is not of microbic origin. It is a condition of the muscles of the neck and mastication, if I remember correctly.

Dr. WEEKS : That is what is nearest like tetanus. It is possible the gentlemen have called it tetanus for want of a better name.

Dr. OWRF : Dr. Wright says eruption of teeth should not indicate change of diet. Dr. King particularly emphasizes that in his work on the diseases of children, published in 1896, I believe, but perhaps he does not necessarily mean that the change should begin the moment the incisors make their appearance ; possibly he meant it in a more general way, as I certainly understood it so myself.

THE DENTAL REVIEW.

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PUBLISHED MONTHLY

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITOR: A. E. MOREY, PH. B., D. D. S.

A MUCH NEEDED REFORM.

We had occasion some time ago to address a letter to several members of the dental profession soliciting papers for publication in the DENTAL REVIEW and very shortly we received a number of replies. The following comes from a member of the profession in our own State of Illinois:

"Dear Doctor: I am in receipt of a communication, presumably from you, requesting something from my pen for publication in the DENTAL REVIEW. I have not had the time to even reply in a suitable manner to your note. I have been asked repeatedly to write for journals and to write papers for associational meetings and have complied whenever convenient to myself. I would like to oblige you, or those who wrote in your name, but cannot promise anything for some time. I have a great deal of that kind of work to do locally and feel unable to devote more of my time to it, at present, though it is a relaxation to me. But I have often thought a series of well written articles on the use of the English language ought to be placed in some conspicuous place where many dentists (and that includes some who write and talk a great deal) could con them o'er and o'er and profit thereby. Nothing personal in this, my dear doctor, I assure you. While not strictly of a professional nature, this subject could be made sparkling and interesting. For my part, I am tired of dry as dust discussions and worn-out theories and speculations and hazards.
Respectfully."

We think our correspondent has just cause for complaint in arraigning many writers for their lack of knowledge of what constitutes good English. Much of the manuscript received by the editor needs careful revision and in some cases even rewriting fails to make it much better because of the poor logic, faulty arrangement and the absence of thought in the articles themselves.

To such persons, a course of reading, which would include Macaulay's essays, the masterpieces of Thackeray or Edgar Allen Poe, the letters of Junius, Curtin's translation of Quo Vadis, or

the life and letters of Geo. Ticknor, edited by Geo. Ticknor Curtis, would prove a source of much profit for the cultivation of style and the habit of thinking.

It is easy enough to run off a page or two without thought, but it is not possible to prepare an essay of five or six pages that will be interesting and instructive to a reader unless it shall have a central dominating thought. There is a growing tendency to write much to fill space and too little effort made to make it full of substantial reasoning to convince the reader of the writer's ability and desire, to convey something that will require a mental effort to grasp it. Let us have the results of deep thinking and hard study and the plaint of our correspondent will not cut so deeply in the future as it must be granted it does at the present writing.

REPORT OF THE COMMITTEE ON NECROLOGY OF THE NATIONAL ASSOCIATION OF DENTAL FACULTIES, AT OLD POINT COMFORT, ON THE DEATH OF DR. FRANCIS PEABODY, OF LOUISVILLE, KY.

WHEREAS, Death has taken from among us Dr. Francis Peabody, of Louisville, Ky., and

WHEREAS, We feel that in his death the profession has sustained the loss of an able practitioner and teacher; therefore, be it

Resolved, That we tender to his bereaved family our heartfelt sympathy, and that we cause these resolutions to be entered upon the minutes of this association; and, be it further

Resolved, That a copy of these resolutions be sent to the dental journals for publication.

PROF. FRANK ABBOTT.

WHEREAS, Death has removed from our ranks Prof. Frank Abbott, of New York, and

WHEREAS, On account of his social qualities, his genial companionship and his ability as a practitioner and teacher of dentistry, we realize the great loss to the profession in his death, therefore, be it

Resolved, That we tender to his family the sincere sympathy of this association, and request that these resolutions be spread upon the minutes of the association; and, be it further

Resolved, That a copy of these resolutions be sent to the several dental journals of this country for publication.

INTERNATIONAL MEDICAL CONGRESSES.

Several timely articles have appeared in the medical press recently lamenting the fact that these bodies are growing in numbers to such a degree that they are unwieldy and that the results from a scientific standpoint are not as valuable as in former years. The suggestion that such congresses should be delegated bodies may not lessen the attendance but it would improve the *personnel* and the work would be better done. The holiday aspect is very attractive to many and prospects of banquets and the possible hearing of a paper from a world-wide celebrity, receptions, glances at royalty, all of these have attractions for many which a strictly scientific collation would not. After all, the success of a congress must not be wholly decided upon the published transactions as it has a broadening effect on the person attending; it widens his knowledge of men and countries and stimulates him to do better work and more study and a closer observation when he returns to his home. A curtailment in the expenditures for government soirees and entertainments would be a reform first to be instituted, and a lessening in numbers with a more careful selection, would add to the scientific interest of such gatherings.

REVIEWS AND ABSTRACTS.

ANATOMY, DESCRIPTIVE AND SURGICAL. By HENRY GRAY, F. R. S., Lecturer on Anatomy at St. George's Hospital, London. New and thoroughly revised American edition, much enlarged in text and engravings, both in colors and in black. In one imperial octavo volume of 1,239 pages, with 772 large and elaborate engravings. Price with illustrations in colors, cloth, \$7.00; leather, \$8.00. In black, cloth, \$6.00; leather, \$7.00. Lea Brothers & Co. Philadelphia and New York.

In looking over this superb work, the standard for forty years, we note that the section relating to the mouth and teeth is up to date, having been rewritten by Dr. Burchard, of Philadelphia. Dental and medical students will benefit by this revision which is in accord with the state of development in collateral science. If your anatomy is old get a new one, if it is rusty study it up for you may need it sooner than you think you will.

HANDBOOK OF MATERIA MEDICA, PHARMACY AND THERAPEUTICS. Sixth edition. By S. O. L. POTTER, M. D. Philadelphia: P. Blakiston, Sons & Co. Chicago: Edward Speakman. Price, cloth, \$4.50.

As we have had occasion to say in former issues in reviewing Potter's Handbook, it is one of the most concise and valuable works that we use. We could not do without it as a work of ready reference.

A MANUAL OF INJURIES AND SURGICAL DISEASES OF THE FACE, MOUTH AND JAWS. By JOHN S. MARSHALL, M. D., former Professor of Dental Pathology and Oral Surgery, and emeritus Professor of Oral Surgery of the Dental Department of the Northwestern University. Published by the S. S. White Dental Manufacturing Co., Philadelphia. 1897: Price, cloth, \$6.

This work is a text-book of bacteriology, pathology and surgical treatment of the oral cavity. It covers over 700 pages, with 360 illustrations. The fact that the author has for years been a teacher of this branch of surgery demands for the work careful examination. The author has most skillfully classified this matter with the review questions. The illustrations are the best that have appeared for a long time in a work of this kind. If I were to offer a criticism upon this work I should say that the author dealt with the subject in a general way more than is necessary for the oral surgeon. The first two chapters are devoted to surgical bacteria. Some things found in these chapters might have been omitted. Some facts concerning bacteria so frequently found in the mouth should have been mentioned in a work of this nature. For instance, the bacillus of leprosy has played no important part in general surgery. Also in the case of the gonococcus, this micro-organism has only been found in the mouth of the new born in a very few cases. (Rosinski.) Actinomycosis is found more frequently in man than the writer leads one to believe. He gives nothing of its treatment nor the differential diagnosis between it and tubercular cervical glands. Moreover in a space devoted to the bacillus of tuberculosis the student should have been given more of the elementary technique for the staining of sputum and tissue.

The chapter on ankylosis seems quite incomplete, as it does

not mention how dentition is interfered with when this disease occurs in early life.

In the chapter on dentigerous cysts the author has brought in some excellent points with regard to their connection with devitalized teeth. This book will certainly find a useful place in the teaching of oral surgery, not only in dental but in medical schools. The mechanical execution of the work leaves nothing to be desired.

G. W. C.

DOMESTIC CORRESPONDENCE.

OXYCHLORIDE OF ZINC.

EDITOR DENTAL REVIEW.

CHICAGO, September 27, 1897.

Dear Sir: In the September number of your journal there appears a paper from Dr. H. T. King on Oxychloride of Zinc. This paper seems to have been written for the purpose of reviving an old notion regarding the use of this agent as a root canal filling.

The doctor claims for this agent the following advantages:

First. Its strong affinity for water.

Second. The ease with which it can be manipulated.

Third. Its mummifying effect.

Fourth. Advantages arising from its escharotic effect

Fifth. That it is readily tolerated by the tissues in the apical space.

The doctor quotes from the recorded sayings of practitioners twenty years ago in support of his position. I wish to confess at the outset that the theories presented are those that were held by many good men twenty years ago but not by all. We have progressed in these matters, and a few theories that were at that time considered debatable are now settled facts, and many other theories have been proven false.

To my mind the theories of this paper have been exploded long ago. Let us briefly consider the so-called advantages one by one.

First. As to the affinity of oxychloride of zinc for water. The chloride of zinc has a very strong affinity for water, but that of oxychloride is comparatively slight.

Of what advantage is this affinity in the root of a tooth? Where does the water come from? Scientific men never attempt to fill root canals until they are first thoroughly dried. Why?

Because a moisture proof filling cannot be made in the presence of water, I care not where or what the material used is composed of.

Second. The advantage of ease of manipulation, of course, will always be debatable, for what is easiest in one man's hands may be difficult in another's; so we will pass this at present and a little later describe a method of filling root canals.

Third. The mummifying effect is absolutely worthless so far as the contents of a root canal is concerned, for there is absolutely no excuse for leaving any animal tissue in a canal where it is possible to insert oxychloride of zinc. A canal that is large enough for that will easily admit of removing the animal contents. If there ever is any need of mummifying the contents of root canals (which I do not admit) then there are a number of other agents that will certainly do it better than oxychloride of zinc, notably, arsenic, formalin, glutol china sal.

Fourth. Regarding its escharotic properties, I cannot see where there can be any advantage or need for such an agent in the root of a tooth as a final filling. At this stage of the case where is the tissue to be coagulated? It should have all been removed by this time, else the root is not ready for filling or is too small to fill with this substance.

Fifth. There have been abundant experiments made which have proven beyond a doubt that oxychloride of zinc is not so readily tolerated in the apical space as is gutta percha, so there can be no advantage there. I believe the less of any substance we put into the apical space the better for the future of the peridental membrane.

The method of using gutta-percha for filling root canals is substantially as follows: The canals must first be rendered aseptic and cleaned—mechanically and chemically—the detail of which all understand. They must then be thoroughly dried by the use of, first, antiseptic oil, which is absorbed so far as possible with antiseptic cotton, then alcohol, hot air, and finally a hot root canal drier, the branch of which for use in small canals can be as fine as any broach. When the canal is thus made thoroughly dry, a gutta-percha cone is selected and rolled and fitted to the canal; the walls are then slightly lubricated with hot eucalyptol, after which chloro-percha may be readily pumped, and finally the cone introduced, using care to exclude the air and get the cone to the

end of the root. In very small canals I have been using Gramm's fine copper points instead of the cone. I also render my chloro-percha antiseptic by adding 1-10 per cent formalin to the chloroform, and with this dissolve the gutta-percha.

The above is the method easiest for me, and I feel very certain will bring the best and most certain results of anything of which we have any knowledge at the present time. Yours truly,

ELGIN MAWHINNEY:

PRACTICAL NOTES.

CHLORO-PERCHA VS. WOODEN POINTS.

EDITOR OF THE DENTAL REVIEW:

Dear Sir: I, for one, cannot pass by the perusal of the paper read by Dr. Geo. A. McMillen, before the St. Louis Dental Society, on the subject of "Filling Root Canals with Wooden Points," published in the September number of the THE DENTAL REVIEW, without entering my protest against such practice.

Without going into a lengthy discussion, I wish to state that, judging from an extensive experience in treating and filling root canals, I would consider the practice of filling canals with wooden points as a hazardous procedure in a large majority of cases.

Dr. McMillen's method might be safe in filling large canals of easy access, but for any one to undertake to follow his method in every instance, or even in a large percentage of cases that the profession have to deal with, would, in my opinion, result in failure and much injury to our patients.

To state that the fine and tortuous canals that I have had to deal with in my practice could all have been entirely and successfully filled by driving wooden points into them is beyond my comprehension and belief.

My opinion and judgment of such practice has very recently been very much strengthened by a case coming to my notice which I will cite.

A lady called upon me at my office and requested me to give her teeth a careful examination, which I did.

Upon examination I found a fistula of an abscess at the roots of an upper second molar which had been crowned with a gold shell crown to support a gold bridge. The conditions were so

serious that I removed the bridge, and more than that I extracted the molar on account of much of the alveolar process surrounding the roots having been dissolved away by the pus of the abscess, subsequent treatment being also necessary to effect a cure.

After extracting the molar I gave it a careful inspection to ascertain how the canals had been filled, and found wooden points had been used for that purpose, and just as you might expect I found that the wooden points lacked considerable of reaching the apical end of the canals, which, I think, easily accounted for the abscess and subsequent loss of her bridge, her tooth, and much of the surrounding alveolar process.

Her astonishment was great upon learning the seriousness of the case.

I inquired how long she had noticed the fistula in the gum. She replied that she had had the "gum boil" there for three or four years, but did not imagine that it amounted to anything.

In conclusion I will state that I am positive, judging from the thousands of canals that I have successfully treated and filled, that if I had treated this tooth above referred to in the beginning, and had filled the canals with chloro-percha, as I always do, this patient would not have lost her tooth.

H. A. CROSS.

A SMALL POINT.

By J. H. HUGHES, D. D. S., GOSHEN, INDIANA.

In capping small exposures, or when putting cement into an excessively sensitive cavity, I am accustomed to use a stiff paste of white oxide of zinc and oil of cloves next the pulp or dentine. I found it difficult to carry this paste to the exact spot, and leave it there, owing to its strong inclination to stick to the instrument used in depositing it.

Finally I almost by accident discovered that if the paste were made into a little ball, that this could be carried to the cavity and placed exactly where needed, or spread over the exact amount of surface required, by using a bit of spunk in the pliers, as carrier and spreader; the spunk coming away almost clean, or at most with only a little oil upon it. This is a little point, but since I developed it it has given me a great amount of satisfaction.

MEMORANDA.

Dr. E. S. Talbot has returned from Europe.

Dr. C. H. Darby, of St. Joseph, Mo., was in Chicago in October.

Dr. Wm. Carr, of New York, spent a few days in Chicago in October.

Dr. M. H. Aspinwall has returned from a five months' tour in Europe.

Don't forget the Northern Illinois Dental Society at Rockford, October 21-22.

Dr. W. G. A. Bonwill has been made an honorary member of the central society of German dentists.

Dr. G. C. Daball came over this summer, but he gave Chicago a Klondike look and went home again.

Dr. Albert E. Morey will lecture on operative dentistry this winter in the Columbian Dental College.

Dr. Geo. W. Field, of London, England, dropped down into Chicago in September looking as youthful as ever.

Dr. A. E. Matteson will deliver a course of lectures on orthodontia in the Northwestern College of Dental Surgery.

The Columbian Dental College, of Chicago, was placed on the list of recognized colleges by the Illinois State Board at its last meeting.

If a drop of oil of cassia is added to every ounce of listerine, Pasteurine borolyptol or euthymol, it makes all of them more valuable as mouth washes.

The State Board of Dental Examiners met in Springfield September 28, 29. Twelve candidates for license were examined of which number eight were successful.

Dr. P. Gires, of Paris, has been sent to the United States by the French government to make a study of the system of teaching dental surgery for home use and improvement.

The Lake Forest University at its last annual commencement conferred the degree of master of arts on our confrère, Dr. C. N. Johnson, a degree most worthily conferred.

Dr. Wm. Mitchell was dined at the Leland hotel, on his way to New York, by the following named: Truman W. Brophy, E. A. Royce, C. N. Johnson, L. L. Davis, J. G. Reid, P. J. Kester, C. S. Case, A. O. Hunt, F. H. Gardiner, J. W. Wassall and A. W. Harlan.

GRESOLID.

Under this name a substance has been brought forward in Germany as an intestinal antiseptic which is said to be a compound of magnesium and phenol. It is a white powder of marked odor and taste.

Dr. W. C. Barrett, the fighting editor of the *Dental Practitioner and Advertiser*, was in Chicago for a few days in October. Dr. Barrett has the same high regard for the N. A. D. F. that we cherish in our own bosom, ditto for the N. A. D. E. When they get a "hump" on themselves and do a little elevating it will be better all around.

The American Dental Weekly, edited by B. H. Catching, D. D. S., Atlanta, Georgia. Price, \$2.00 per annum. Vol. I. No. 1. September 9, 1897. This is the second venture in the United States and we hope it will be successful. There is a large field for it, and the editor has had long experience. The first issue is very attractive.

ROENTGEN RAYS PREVENT OPERATION

Dr. Vasseur, of Marseilles, swallowed a bone, which lodged in his throat. Thinking it still there, an operation was about to be undertaken, when the rays were utilized and showed that the foreign body had passed on, leaving only its irritation behind. An operation was thus obviated.

DENTAL WAX

Take of French chalk, 14 parts; gum kauri, 8 parts, and stearine, 4 parts. Melt the stearine on a water bath, then add the finely powdered gum kauri in small quantities. When dissolved, sift in slowly the French chalk, and stir constantly till cold. The composition can be colored with carmine if desired.

According to a paragraph in Dr. Casey A. Wood's letter to the journal of the *American Medical Association*, "I have been informed that the dental clinic, attached to the university dental school, where five sessions of six months each are required for graduation, was attended by nearly 10,000 patients in 1896. Although the methods employed are still somewhat antiquated, it is found in a building whose appointments far surpass anything of the kind we have in America. It has among other conveniences, two laboratories, a library and a large museum filled with all sorts of anatomic, microscopic and chemic preparations."

ARTIFICIAL CORUNDUM.

Loyer (*Chem. Zeit.*) states that if sodium aluminate be heated to a red glow in the presence of chlorine, a crystalline mass is obtained in which corundum appears as hexagonal tablets, along with sodium chloride. The reaction is attended with evolution of oxygen. Washing out the sodium chloride frees the crystals. If now we add to the sodium aluminate small quantities of chrome alum in varying proportions, and submit the mixture to the same treatment (heating in the presence of chlorine), we can produce at will the colored varieties of corundum, the ruby and sapphire.

Dr. Thos. W. Evans, of Paris, France, spent a few days in Chicago in September. Dr. Evans visited the Chicago College of Dental Surgery, the Armour Institute, the Athletic Club, the Union League, Illinois Club, and all of our large parks. He had not been in Chicago for nearly fifty years, and of course the changes were so great that the only landmark he said was the water in Lake Michigan! He was dined by Drs. Brophy, Johnson, Reid and others at the Athletic Club, and held a little reception there on the last day of his stay in Chicago. Drs. Wassall, Gardiner, Kester, Carpenter (E. R.), Ottofy, Brophy, Harlan, Reid and Hunt wished him a safe voyage to LaBelle France.

Dr. H. A. Knight, of Minneapolis, uses for frail teeth, especially bicuspid and cuspids, a combination of cement and amalgam about as follows. The cavity is first lined with rather thin cement, then a mass of already mixed amalgam and cement is placed over this to nearly fill the cavity and the whole surface is

covered with amalgam. Dr. Knight claims that there are many teeth of this character which it is not desirable to crown, and the patients being too poor to pay for gold fillings or crowns, their teeth may be saved for several years in this way of operating, and the color be good during the time the filling is in place. Specimens which he exhibited at Minneapolis demonstrated that such fillings are very adherent in the walls of the cavity.

POLISHES FOR METAL.

J. H. K., Illinois: In a note printed in the *Circular* for February, page 47, the principal polishing agents are named with mention of how pastes may be formed from them. A formula is there given for a polishing tablet, and one also for a liquid polishing preparation. From a previous volume we take the following as types of polishing pastes:

I.		Parts.
Rotten stone.....		1
Iron subcarbonate.....		3
Lard oil a sufficient quantity.		
II.		Parts.
Iron oxide.....		10
Pumice stone.....		32
Oleic acid a sufficient quantity.		

DENTAL ASSOCIATION OF NEW SOUTH WALES.

The annual meeting of the dental association of New South Wales was held on Friday night at the Australia Hotel, Dr. Burne occupying the chair. The president's report stated that the dental bill was now before the lower house of Parliament, having passed the council in July last year, and it was hoped that it would be passed into law this session. Congratulations were given to chemists on the pharmacy bill having been passed into law. The balance sheet showed a balance to credit of £109 11s 5d. On the motion of the president, the report was adopted. The election of office bearers for the ensuing year resulted in the old officers being reelected: President, Dr. Burne; vice presidents, Messrs. H. Paterson and S. Chaim; honorary treasurer, Dr. O. Davis, honorary secretary, Mr. H. Taylor; committee, Messrs. C. Marshall, F. J. Holway, H. S. Newton, E. A. Gabriel, and J. S. Darton; and auditors, Messrs. B. Corbett and C. Chandler.

GLYCERINE IN TOOTH PASTE.—T. H. H., INDIANA.

We imagine that separation of glycerine from your tooth paste is due simply to putting too much in. The powder should be beaten up with only glycerine enough to form a stiff mass. Try the following:

Prepared chalk	8 ozs.
Powdered orris root.....	4 ozs.
Carmine, No. 40.....	2 drs.
Oil of rose geranium.....	30 mins.
Oil of sandal.....	10 mins.
Glycerine, a sufficient quantity.	

Rub the carmine thoroughly with a small portion of the chalk, then triturate the remaining solids together, finally adding the oils and enough glycerine to form a paste.

The foregoing may be varied by replacing half of the chalk with a like quantity of powdered soap.

CONGENITAL TEETH—THREE CLINICAL CASES.

Dr. J. W. Ballantyne (*Gaceta Médica Catalana*, December 15, 1896) concludes an article on this subject as follows:

1. Congenital teeth form a rare anomaly, which for a long time has been known to physicians and the laity.
2. Their presence exercises an evil effect upon lactation, in part by the effect of the imperfect occlusion of the child's mouth, and in part by wounding the mother's nipple; it can also originate sublingual ulceration. Infantile diarrhœa and general atrophy are the most remote consequences. At times, however, the symptoms are absent.
3. Congenital teeth have little or no prognostic significance as to the corporeal or mental vigor of the child that presents them.
4. The teeth usually found are the lower incisors, at times the upper incisors, and very rarely the molars of the inferior or superior maxillæ.
5. In some cases we have a history of heredity.
6. As congenital teeth ordinarily are incomplete and badly developed, and apparently are inconvenient rather than advantageous to the child, it is recommended to practice their avulsion shortly after birth—an operation which can be easily executed, excepting in very rare cases, and which is free from complication.
7. The appearance of premature teeth in certain well-known historical personages is an interesting fact, whose importance, on the other hand, has been greatly exaggerated.

SMOKE

At a debate on smoking, among the members of the British Association, many speakers denounced and others advocated the practice. Prof. Huxley said: "For forty years of my life tobacco has been a deadly poison to me. [Loud cheers from the antitobacconists.] In my youth, as a medical student I tried to smoke. In vain; at every fresh attempt my insidious foe stretched me prostrate on the floor. [Repeated cheers.] I entered the navy, again I tried to smoke and again met with a defeat. I hated tobacco. I could almost have lent my support to any institution that had for its object the putting of tobacco smokers to death [Vociferous applause.] A few years ago I was in Brittany with some friends. We went to an inn. They began to smoke. They looked very happy and outside it was very wet and dismal. I thought I would try a cigar. [Murmurs.] I did so. [Great expectations.] I smoked that cigar, it was delicious. [Groans.] From that moment I was a changed man; and now I feel that smoking in moderation is a comfortable and laudable practice, and is productive of good. [Dismay and confusion of the antitobacconists. Roars of laughter from the smokers.] There is no more harm in a pipe than there is in a cup of tea. You may poison yourself by drinking too much green tea and kill yourself by eating too many beefsteaks. [Total rout of the antitobacconists and complete triumph of the smokers.]

OBITUARY.**DR. E. MAGITOT.**

The Odontological Society of Chicago, recognizing the great services rendered by Magitot to the advancement of dental science, has adopted and ordered sent to the dental journals of the United States and France, and to the family of the deceased, the following :

Magitot was born in Paris in 1833, and died there during the current year. His first contribution to dental literature was made in 1857 at the age of 24, relating to the structure and development of the human teeth, while the last came from his pen in 1897, just before he died. During these forty years Magitot wrote no less than sixty-five books, essays, pamphlets, etc., dealing exclusively with nearly every phase of dental embryology, histology, biology, pathology, hygiene, etc. No writer of any age has made as many, as varied and as valuable contributions to dental science as has Magitot.

The priceless services rendered by him entitle him to rank as one of the foremost investigators of odontology. He was a member of numerous scientific bodies and societies, whose members sincerely mourn his loss. It may be truly said that when Magitot passed from the scenes of human activity, dental science, not of France alone, but of the entire world, lost one of its noblest and greatest minds.

The dental profession of the United States, recognizing and appreciating Magitot's services, keenly mourns and sympathizes with his bereaved family and the profession of France by reason of his demise.

A. W. HARLAN, }
J. W. WASSALL, } Committee.
LOUIS OTTOFY, }

Chicago, September 1, 1897.

THE DENTAL REVIEW.

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No. 11

ORIGINAL COMMUNICATIONS.

REPRODUCTION OF GUM TISSUE*

BY GEORGE T. CARPENTER, M. D., D. D., S., CHICAGO, ILL.

What can be done for receding gums?

This is a question which is answered very quickly by a great many operators and their answer is that we can do very little, if anything, to restore this lost tissue, and in my judgment the trouble has been that very little experimental work has been done in this direction and the literature is very near silent on the subject. A review of seventeen years shows three articles on sponge grafting and one on the use of resorcin in cases of receded gums.†

It is not my purpose in this paper to give the etiology of receding gums, but I would suggest that the receding process be checked and the gum tissue returned to a condition of health before any attempt at reproduction be commenced. All dental operators have seen large proximal and buccal cavities of decay filled with gum tissue, sometimes very vascular but in other cases this tissue will be found firm and healthy. Ill fitting plates will sometimes cause a growth of gum tissue. Deposits on the necks of teeth just under the gum margin will in rare cases cause an extra gum development. A lady who was waiting for a friend in my office, called my attention to a full upper plate which she

*Read before the Chicago Dental Society, October, 1897.

†Atkinson (W. H.), *Pyorrhœa Alveolaris* sponge grafting as relative to. *Tr Am. Dent. Ass. Phila.*, 1885. XXV., 149-160 Also *Brit J Dent Sc. Lond.*, 1886, XXIX., 529-534.

Brunton (G.). *Sponge grafting.* | *Brit Dent. Ass. Lond.*, 1892. XIII., 352-354.

Copeland (I. W.). *The use of Resorcin in Cases of Receded Gums* *Dental J., Ann Arbor*, 1896, V. 6-8.

wore. The plate was of rubber and was broken into halves between the central incisors and in this condition had been worn with comfort for over two years. The gum and mucous membrane of the palate presented a ridge, a section of which would make an inverted T which extended from the centrals to a line near the soft palate. The membrane was in a fairly healthy condition. This condition of things formed a basis for some experiments. I found that the sharp irregular edges of the cavities or edges of the plate caused the irritation, and the overhanging walls acted as a protection for the new growth (which I do not claim as a new discovery). But after some thought and work along this line, I was convinced that if the same conditions could be brought about where gum tissue was deficient, that the tissue would be reproduced; but how to do it was the query. Irritation to cause granulation and protection to prevent their displacement or destruction. Chemical irritants of various kinds were used and their action on the tissue closely watched. Mechanical irritation was also tried, among which was the lancet and the use of barbed or roughened wire, also sharp or irregular edges of different metals inserted in various ways, producing either internal or external irritation of the gums. The manner of protecting the parts was also a study. Several different varnishes were used, also chemicals that formed combinations with the surface of the tissue producing a film as a protection for the deeper seated parts. I also used mechanical devices of different forms and materials, many of which were found worthless.

In order to be successful much depends upon the physical and mental condition of the patient, who must thoroughly appreciate the need of the tissues to be reproduced and be willing to coöperate with the dentist and carry out in detail all instructions. Protection of the parts may be secured by a vulcanite rubber hood, which, if carefully made and adjusted, can be worn with comfort. To make the hood, an impression should be taken of the receded gum with modeling compound, taking first only one side, cool the compound and then take the other side, letting the soft compound extend over the hard, remove, place in position and make a model of plaster. I then restore on the model with plaster or wax the absent gum, building as high or a little higher than the surrounding gum. A sheet of thin wax is then slightly warmed and pressed upon the

newly built part, letting the wax extend to the surrounding gum and a little distance upon and between the teeth (as shown upon models). This may be flaked, packed and vulcanized. Either the vellum rubber or the ordinary vulcanite rubber can be used, as the case may indicate. Platina plate or wire may be vulcanized in the rubber so as to extend between the teeth, and bent so as to hold the rubber hood in position, or ordinary rubber bands may be vulcanized in the rubber so as to be stretched over the teeth for support, or it can be kept in position by silk or wire ligature. Rubber made in this way will form an excellent protection to the parts to be operated on. Tincture of iodine should be used upon the gums until a firm rounded margin is obtained. The irritation is produced just under the gum margin by a clamp made of thin clasp metal, armed with a sharp edge standing at right angle and made of the length and shape to produce the irritation where re-

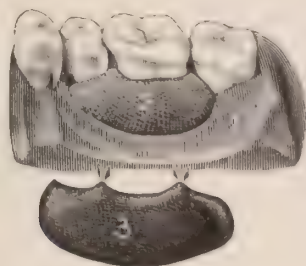


FIG. A.

FIG. A. No. 1. Plaster model.

No. 2. Plaster of Paris which fills depression made from loss of gum tissue.

No. 3. Hood made of wax and when set in proper position on model is ready for flasking.

quired. This instrument will hug the root tightly and will keep in position. After adjusting the clamp, the parts are then stimulated with a solution of nitrate of silver $\frac{5}{1}$ to distilled water $\frac{5}{1}$. The rubber hood should now be placed in position and the condition watched from time to time. Granulations can be observed and the growth of gum tissue noted. This is my present method of reproducing gum tissue, but I do not claim that the results will be the same in all cases. You will find cases where you will be much discouraged, but I think that all cases are helped by this treatment.

You will find also cases where the gum could be extended to the grinding surface or cutting edge of the teeth.

There is another condition which I would call atrophy of the gums. The gums are pale and very thin at their margins and we have an absence of the alveolus, and in some cases V-shaped exposures of the root almost to the apex.

Treatment: After all deposits are removed the gums are painted lightly with tincture of iodine every second day, also stimulated at intervals with a solution of nitrate of silver, until the festoon becomes rounded and healthy. In case of the V-shaped exposure, a hood should be made as described above and after the parts are carefully cleansed antiseptically, the margins should be

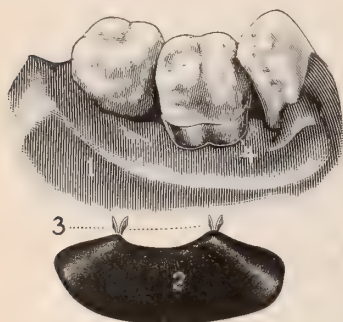


FIG. B.

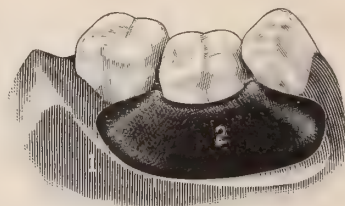


FIG. C.

FIG. B. No. 1. Plaster model.
No. 2. Vulcanite rubber hood.
No. 3. Platina strips which pass between the teeth.
No. 4. Clamp of clasp model in position.

FIG. C. No. 1. Plaster model.
No. 2. Rubber hood in position.

carefully pared and an incision made on either side, passing down close to the periosteum so as to make two flaps which can be brought together with a stitch, using a very fine needle and a silk ligature. When the edges are made to approximate, flood the parts with nitrate of silver 5 ss to the ʒ i of distilled water and place the rubber hood in position. Watch carefully for a few days and remove silk as soon as tissues unite. If there is any tendency to gap, touch the edge with crystal nitrate of silver.

I have good results from this treatment. I have not been able to restore the alveolar process, but I am not willing to say that it cannot be done. I think that there are great possibilities in the future for surgery of the gums, and I earnestly hope that others may give us the result of their experience in this direction.

PRESIDENT'S ANNUAL ADDRESS.*

By E. H. ALLEN, D. D. S., FREEPORT, ILL.

The annual meeting of our dental society has come once more. We are here in convention to learn of each other, and our purpose in attending the meeting of this or any other dental society should be to imbibe and impart knowledge in the science and art of dentistry. The scope of the president's address should be of a broad and general character. He should point to a needed reform in the conduct of these meetings that the usefulness might be enlarged. From observations of the past, I will, with your permission, point to a serious defect that the society seems to be developing. It is the unwillingness of a large part of the members to take an active part in the proceedings of the annual convention. This is wrong, first, because it imposes frequent burdens on the active and willing few, who are willing to take an active part, and do their duty; second, the neglect to take an active part in society work is injurious to those concerned, because the one who does his share, in preparation of papers, discussions and clinics, is at the time helping those who are present and broadening and educating himself. I think no one, however timid he may be, can get up to express some thought he may have on the subject for discussion without helping some one present and at the same time strengthening himself, so that he finds the effort not such a great one the next time he gets up to speak as he did the first.

When the executive committee calls on you for a paper or a clinic, say "Yes" promptly. Then the committee will have no excuse for the programs being late. What a good time we could all have if all would make this a regular experience meeting. When this state of affairs comes about this society and others that I could name will not be open to the criticism that the society is run by the Chicago men. This is the most serious fault I have to

*Read before the Northern Illinois Dental Society, Rockford October 1897.

find with this society and I trust that at this meeting a marked improvement will be noticed. Before this society meets again the political campaign for the election of members of the lower house by the State legislature will be on. I am confident that with work on the part of each dentist an influence could be brought to bear upon the members of the legislature so that a bill for the passage of a better dental law in this State could be passed, if it be within the bounds of reason. What is needed is concerted action on the part of the dental profession. This is what a prominent member of the house of representatives told me the other day. The past year has not been marked so far as I know, by startling discoveries in dental science, but the year has been one of steady progress. We are acquiring a more certain knowledge of methods of practice of dental materia medica, histology, pathology and of dental hygiene. It is pleasing to note the attention given to the hygienic conditions of the mouth. Compare the present with the not distant past and I think it will easily be seen that a vast improvement has been made in this respect. Let this good work go on.

Operative and prosthetic dentistry are at the top. In the operative, the tendency is to make operations less painful without depreciating the thoroughness of the operation. Cataphoresis has been under development since we met last year at Elgin. I think it may be said that we know more of it, at least more of its limitations. In prosthetic dentistry the use of high fusing porcelain in crown and bridge work is made more generally possible by the introduction of electric furnaces. Beautiful effects in the reproduction of natural appearance of crowns and bridges is in this way rendered more possible than by the use of gold. Time will determine as to the durability. These electric furnaces ought to bring continuous gum dentures into more general use. These furnaces can be used with either the direct or alternating electric current, and as nearly every town from 10,000 inhabitants upward has either one or the other system, the use of electric furnaces should become quite general. One more thing I wish to refer to. Dentists as a class do too much credit business. They are not particular as to what individuals they permit to run accounts. The only way that a dentist should do if he must do a credit business at all, is to have an understanding with the patient at the outset when the account is to be paid and more than all he should know as to the probability of the patient's fulfilling the terms of the agreement. We

should insist on short credits and prompt settlements. Any one who objects to such rules without giving a good reason therefor, you had better not present them with your services. The prevailing custom among the dentists as a class of long credits and slow settlements has brought the dentists as a class into disrepute among the business men. We all have to suffer from it. I understand that the great commercial agencies give the dentists no rating whatever. With this I will close urging you all to reform in this particular if need be.

THE POSSIBILITIES OF PROSTHETIC DENTISTRY.*

By E. J. PERRY, D. D. S., CHICAGO, ILL.

A consideration of the possibilities of prosthetic dental art might lead one to the discussion of impracticable ideals, but then the question comes back to what extent are ideals impracticable? This society must and is intended to deal with practical things. My friends, the practical in this world and in our chosen field must come nearer to the ideal. There should not be such a wide interval between ideal and practical excellence, but a perfect and harmonious blending of both qualities. A conscientious study of prosthetic dental art will be found to require in order to attain the esthetic and the useful without sacrificing one to the other qualities of mind not common to the artisan. A creative quality of mind is indispensable to the construction of a full denture. A person with edentulous jaws is in a sorry plight. He is indeed unfortunate. The features are changed and distorted. The brilliancy and beauty of the face divine is gone. His digestion impaired; his days shortened. To whom shall he go? To the dental mechanic? No, but alas, he has no other place where he can go. Why don't the profession take this unfortunate person's case to heart? Who is to blame that so many persons wear false teeth, and so few wear artificial ones? Is the person so afflicted or the profession? The profession is to blame. Let us go back a few years. Let us be reminiscent for a time. We will see, I think, wherein lies the cause. When your essayist began to study dentistry, the metals, gold, silver and platinum, were just packing their trunks in disgust and preparing to leave the laboratory. I was

*Read before the Northern Illinois Dental Society, Rockford, October 1897

introduced in the most formal way, and away they went. Vulcanite had run them out where for long years they had held full sway. My preceptor served four years' apprenticeship in the laboratory alone. I served one year, then went to college. What did I find in the laboratory there? Vulcanite was supreme. Gold and silver and platinum had gone, and no one was left to speak of their good qualities. Their biographies were read, that was all. Where was the unfortunate individual with the edentulous jaws. He was steered up against Mr. Vulcanite. His predecessors in trouble had been taught by the former knights of the laboratory to pay handsomely for services rendered. Hence it was easy to get a big price for vulcanite, and the work quickly done. Then came in the Barbarians and the Philistines, and competition ran down the price. The best men went into the operating room and the breach between the two widened. This was the state of affairs up to the advent of modern crown and bridge work. Now the future looks bright. The metals with their bright faces have forced terms with the despot vulcanite and the operator, however high his dignity, can sometimes be found in the laboratory, and to my optimistic vision the possibilities of prosthetic dental art are indeed ranging into the realm of real probabilities. Much is to be done. Line upon line and precept upon precept are to be written. We must begin at the societies and colleges.

Ability of a high order is coming into the laboratory, the electric furnace, electric lathe, the various methods of making crowns and bridges and dentures and the fascination of the dental ceramic art are forcing up the standard of prosthetic work. Crown and bridge work have lifted into the free air and pure sunshine the banner of prosthetic dental art. It has washed up the benches and cleaned up the laboratory, so that its dingy walls and disgusting filth are no longer its distinctive features. But instead, the laboratory is neat and clean, artistic and convenient in arrangement and altogether in a first-class office the most fascinating place in which to work. The metals have done this. Ceramics are now, and are in the future to cut a large figure in dental practice. They exact of its servants neatness and methodical precision. Crown work of any sort exacts of the dentist not alone mechanical excellence, but artistic conception, ingenious and creative skill, esthetic tastes, and the discriminating power of application. The importance of prosthetic dental art to humanity is

forcing itself into the heart and mind of the profession. Not the artisan, but the artist, the doctor, the dentist, who combines in one brain case all these in one. He is thinking, and the aforesaid unfortunate person with toothless and expressionless face is being steered up against a very different proposition. Doubtless the almighty dollar has a finger in this pie and is an important factor in the case; but no matter, the results are the same, and the credit is not discounted. I say to you, if perchance you are here, you who extract aching or devitalized teeth, you who recommend rubber as the best base for artificial teeth, or you lily fingered operators who never do any plate work, who do not go into the laboratory except to smoke or black your boots, who have laboratories only for the storage of filth, soiled towels, cast off clothes, and broken furniture; I say to you, whoever you are or where, look to your laurels; the new day has dawned; the triumphal car is coming; an exacting public will disown you, and if you should fall you will be trampled on and you cannot see the procession for dust. Go from this meeting ye who fall under this description and clean up your dark and filthy laboratories; put in neat appliances and modern apparatus; get in line of progress; make your own crowns and bridges; get hold of porcelain; catch on to ceramics; stop putting in those ready made hand-me down crowns; get some works on metallurgy and ceramics; give not the hours after you have done a day's work in the operating room, but of your best time and best thought; begin by urging those who can pay to have continuous gum or gold work and their number will grow.

But you must believe what you say and you must be able to do the work. You cannot hire it done; you can hire an artisan, but you will never in this life succeed until you thoroughly master the subject yourself. You cannot even hire it done properly till you can do it yourself. You must be the designer, the creator. You must possess the whole case; you must be the sole master and what you can accomplish will bring to you great joy. The profession must bring this to the great common man. How can it be done? How can the common man be made to appreciate artistic prosthetic dental art? Certainly the first requisite in the matter must be a thorough practical knowledge and appreciation of the artistic in prosthetics on the part of the dentist himself; it must be a conviction with him; it must come from the heart and head

both; he must be able to see the beauties and the utilities of his work ahead of his patient; when he says to his toothless patient a continuous gum set is best, he must have a better reason in his mind than the thought he is rich and can pay for it. The most of our patients, or at least a goodly number, can pay for continuous gums if they are convinced that it is infinitely better for them in whatever way considered. No dentist who is an artist in prosthetic work would himself wear a rubber plate for a full denture. I know patients who would take in washing if needs be to get a continuous gum work. This work must be done by the dentist; if he can't do it or sends to the laboratory man an occasional set for some rich patient, he gets back a continuous gum set less the art. The case does him little good or possibly the patient either, so the whole matter rests with the dentist. He is timid; he is stingy; he is lazy; he is ignorant; he is incompetent; he lacks enterprise; he is not honest; some of these or all of them he is or the people who look for better things would have them. The profession as a whole is to blame for whatever lack of true art there may be in prosthetic work of to-day. You say the people are looking for a cheap thing. This is not true. They are looking for the best as much as ever. You have nothing but a cheap thing to offer them. The dentist himself is the most important factor in raising the standard of professional excellence in a community. The people will not force up the standard for him, but they will recognize and support him by an intelligent appreciation of every effort he may rightly make to elevate and ennoble his profession.

Merit, art, skill, industry and professional excellence do not go unrewarded. Did you ever think how few sets of teeth you have made and inserted that were just right, and how rarely a good piece of work of any sort went unrewarded? Have you so much conceit as to think you cannot be outdone in prosthetic work, either in its design or its mechanical perfection? Do you think the standard is already up, or don't you think it will pay you to hoist it? Let us briefly consider a few points of advantage which lie in the way of say gold for partial sets, or continuous gums for full plate. No one who ever wrote on the subject but emphasizes the fact that a plate covering the tissues for the purpose of carrying artificial teeth should be a good conductor of thermal changes. Here, then, rubber is contraindicated, Gold, platinum or porcelain therefore are indicated. The material of the plate should also

possess the greatest possible strength in the least possible space. Again, rubber fails to fill the requirements of the case, the metals do not. The material of the plate should also be pure and non-oxidizable. Here rubber fails also and twenty karat gold highly finished and triple plated for the partial set and pure platinum and porcelain for the full fill all the requirements of the case to perfection. In continuous gum work the artist has the largest possible liberty in the arrangement of the teeth with exact reference to the artistic requirements of the case, using art to conceal art. He cannot do this by any possible means with rubber. Perhaps one of the most important points gained in continuous gum is in the gum. Arrange teeth in continuous gum work as you may, they look infinitely better than the same arrangement in rubber. One might pass, the other be simply hideous. The advantages of a correct occlusion are easily obtained also in continuous gum work for the metal plate can be used after the pins are soldered to the plate and a gum colored wax used, and not only an absolutely correct occlusion but a study of the restoration of the lost expression can be made in the mouth in a way not possible under any other circumstances. In partial sets the plain plate teeth can be tipped with gold as are facings in crowns and bridges, thus securing durability and strength, either the adhesion plate or broad clasps can be used and in some cases the Condict fastenings are incomparable. Bridge work has lessened the number of partial sets and often the four incisors can be carried in this way, not on two cupsids however. It is not my purpose to detail any method. The discussion ought to bring out much detail. My purpose is to awaken you to the important fact that the prosthetic half of dentistry is to take its rightful place and the results that are possible you are to assist in realizing.

I want you to realize what the possibilities of prosthetic dental art are. What the forces are that are working out a higher destiny for it. Just turn your studies into this channel.

One more word. In some quarters I hear that teachers encourage the separation of the two great branches, operative and prosthetic dentistry. A further specialization of dentistry. An eminent teacher told me that prosthetic dentistry should not be taught in dental colleges, or at least, no attempt made to finish men for practice. A special school for this work. That the practitioner should do only operative or prosthetic work. I cannot

see how any one can so argue. Where we are lame is in the fact that the colleges do not properly fit men to practice prosthetic art, and the practitioner does not spend enough time or study in the laboratory. There is too much specializing. Men do not grow symmetrically in practice. They advance as they think in the groove in which they work, and when men get into a groove as the years go by, that groove gets narrower and the man resembles the groove. A further specializing will destroy the profession. The prosthetic man must work in the mouth and when he grows in this work of prosthetic dental art look for a growth in his operative work also.

THE BLEACHING OF DISCOLORED TEETH.*

BY J. E. NYMAN, D. D. S., CHICAGO.

In the consideration of this subject it may be well to consider first the causes of discoloration. In most of the cases that come to us the teeth have putrescent pulps in them, or it is an abscessed tooth that has been treated and the root canal has not been properly filled. One product of all decomposition of organic tissue is sulphuretted hydrogen, and that coming in contact with the oxyhæmoglobin of the blood forms a sulpho-methæmoglobin which is of reddish green tinge. A reddish green usually expresses the tinge of discoloration we find, because a reddish green is very much like a dirty brown. A strange occurrence which some of you may have experienced, is that if a patient happens to appear to you on one of your busiest days with a tooth that shows unmistakable signs of an abscessed condition, and you are able only to take the time to relieve that patient of the pain by drilling into the canal, and allowing it to discharge its putrescent contents, telling the patient to come in again in a day or two or three, as the case may be, you may be surprised when that patient returns on that second or third day to find that the tooth is discolored worse than it was when you first saw it. There is a reason for that change for the worse, and it is this: If during the action of the sulphuretted hydrogen on the oxyhæmoglobin of the blood oxygen be present the reaction is much more marked and the color formation much more decided, therefore in the case we have just remarked upon, in making a vent for the abscess we have also established an air

*Read before the Chicago Dental Society, June 1, 1897.

passage by means of which the air containing oxygen has intensified the reaction of the sulphuretted hydrogen on the oxyhæmoglobin of the blood, causing more decided discoloration.

The causes of discoloration may be divided into two classes, organic and inorganic. One of the organic causes is that which I have just mentioned, namely, sulpho-methæmoglobin; another the oil of cinnamon when excessively used. These seem to comprise the organic causes. Now, strictly speaking, the causes that I am now about to give are not entirely inorganic, because organic chemistry has played some part in the chemical reactions of these, so to speak, inorganic causes. We will first consider iron.

Miller says that iron is the most widely distributed of all the metals in the human system, and it plays the most important part in the physiology of life, that he finds it present in the vascular tissues, in the pulp and in the pericementum. Now, then, if you come across one of those cases where there is little more iron than is normal in the blood and an abscessed condition has been established in addition to the discoloration from the sulpho-methæmoglobin, there will be a discoloration due to the sulphide of iron. Again, should the patient be suffering at the time this abscessed condition takes place from pyæmia, there would likely be present another discolorizing combination—sulphide of mercury. Then, again, there may be a little excess of manganese in the blood. In that case there might also be formed a sulphide of manganese. There may also be discolorations due to the sulphides of tin and silver, owing to the action of sulphuretted hydrogen arising, it may be from the decomposition of debris of food upon remnants of old amalgam fillings. Another cause of discoloration that I might also mention is that which may be due to the action of the medicaments used, upon the steel in the instruments used; and I believe Dr. Harlan has stated that there may be a discoloration resulting from the use of carbolic acid in the treatment of devitalized teeth. All of these sulphur combinations are of a dark color, varying from brown to black.

These complications tend to make a bad matter worse, although I frankly admit that it is almost impossible to tell just which of these causes has been most actively at work in any one case of discoloration, but it is highly probable that in the majority of cases that come to our notice, it is mainly due to the sulpho-methæmoglobin.

Now, just a word as to what bleaching is. The best definition that I can find is the one given by Dr. E. C. Kirk, in an article in the *Cosmos*, in which he defines it as "the reaction between a substance having color and some substance capable of so affecting the integrity of the molecule of the coloring matter as to cause it to lose its distinguishing characteristic, its color." There are two classes of bleachers, namely, the oxidizers and the reducers. The oxidizers are those which act by oxidizing the coloring material or extracting the hydrogen from it. The reducers acting in exactly the reverse; abstracting the oxygen from the coloring compound. As examples of oxidizers we may mention peroxide of hydrogen, potassium permanganate, chlorine and the chlorine compounds, and as reducers sulphur dioxide and oxalic acid. The ones most universally used are the chlorine compounds and the peroxide of hydrogen, although some use is made of oxalic acid.

Now, necessarily there must be some choice of bleachers, and the question is, which shall it be? Unfortunately for the oxalic acid process we are quite divided as to the exact action of oxalic acid on the structure of the teeth, as to whether it does or does not injure it. However, as I said before, the bleaching agents most used are the chlorine compounds and the peroxide of hydrogen solutions. The objections to chlorine and its compounds are that chlorine has a disagreeable odor, that it affects all steel instruments, that it is such an irritant to the tissues, to say nothing of the possible formation under some circumstances of hydrochloric acid. Personally I do not see how this can take place, but I have heard it mentioned as something that might happen with the use of the chlorine process. This leaves us only the peroxide of hydrogen solutions to consider, and they really seem to be the best of all, because oxygen is a bleacher of world-wide reputation and the decomposition of peroxide of hydrogen gives us nothing but oxygen and a residuum which is nothing more or less than water.

I might, in passing, speak of a very peculiar case which Dr. Sanger, of New Jersey, reported, in which, after successfully bleaching a tooth by the chlorine method, the tooth rediscolored. The only cause he could discover was that a proximal gold filling projected into the enlargement he had made in the pulp cavity. Then he made up his mind that this rediscoloration was caused by the chloride of gold. He said he removed the filling and rebleached the tooth, after taking precaution to wash out the

chloride of gold stain, and then the tooth did not discolor again. It does not seem possible to me that this could have been the cause, because free chlorine will not affect gold. There must be a combination of the two acids, hydrochloric and nitric, popularly known as aqua regia, before chlorine will affect gold. I am inclined to think that that tooth needed another bleaching, and that it was not done thoroughly the first time.

Now, as to the method of procedure when a patient presents himself with a discolored tooth which he wishes bleached. In the first place, do not promise him too much, for there are cases that cannot be bleached, at least cannot be bleached successfully. In the second place, after treatment and curing of the abscess, if there be one, fill the root canal well with gutta-percha or other material that will hermetically seal the apical end. Then enlarge the canal as you would to insert a post for a crown. Thoroughly cut out all the discolored dentine that you can without materially weakening the tooth, because in doing that you very effectually remove part of the discoloration, and leave less work for your bleaching agent to do. Now, the question presents itself as to whether we shall make use of our recent knowledge and appliances in electrical matters, or simply adopt the old time method of bleaching teeth. I prefer the modern method, as it is evident that the action of the electric current makes a freer and more abundant formation of oxygen than can be obtained under ordinary methods, and Dr. Morton's experiments seem to prove that the cataphoric action causes the oxygen to penetrate deeper than it would by ordinary osmosis. But I am very much in doubt whether to call the electrical process cataphoresis or electrolysis. Looking at it from some points of view it seems as if it were electrolysis. Looked at in the light of the experiments of Dr. Morton, of New York, it looks as if cataphoresis were the term for it. A very curious thing about which I am as much in the dark as is any one else is as to just how the oxygen does the bleaching under the action of the electric current. The oxygen has an affinity for the positive electrode and will collect there, while the hydrogen will be driven to the negative electrode. It may do the bleaching by expelling all the hydrogen from that discolored compound, and driving that into the tissues toward the negative electrode, allowing it to be replaced with the oxygen, or it may be that the bleaching takes place owing to the fact of a constant accumulation of oxy-

gen in the region of the positive electrode, giving such an excess that the tissues of the tooth take up some part of it. Which of these two theories is correct I do not know. There have been some appliances devised for bleaching the teeth cataphoretically, so to speak, by Dr. Hollingsworth. They consist, first, of a rubber nipple, which is expanded by means of a nipple expander. After the rubber dam has been adjusted and the preliminary preparation of the tooth completed, this nipple is slipped over the tooth to the neck of it and the expander is withdrawn, leaving the tooth covered with the nipple. A little glass tube with a spiral platinum wire in it is then inserted into the nipple, the nipple closing over it and holding it fast. There are also two little hooks attached that are hooked over the fold of the rubber dam as it is stretched across the patient's face, and support the little tube. Take a tube of 25 per cent pyrozone, which should contain two drachms of pyrozone, wrap it in a towel or napkin which has been soaked in ice water, open it by cutting off the tip with a diamond disk, and empty the contents into an ordinary glass tumbler. 25 per cent pyrozone is an ethereal solution and an ethereal solution is a very poor conductor of an electric current. So add to this ethereal solution of pyrozone an equal amount of warm water, to which has first been added a grain of sulphide of zinc to increase the conductivity of this solution. The ether should then be evaporated by gentle heat until you no longer get fumes of it from the solution. The solution will then be aqueous instead of ethereal and will be ready for use. The stopper is now removed from the little glass tube. A double bulb syringe which I will describe has been devised for filling it. The further or second rubber bulb of this syringe is first collapsed and the point of the syringe inserted in the pyrozone solution and this second bulb is then allowed to fill with the pyrozone solution. A little platinum tube runs clear through this outer rubber tube into the second bulb; but the second bulb has no connection whatever with the first bulb. Attached to this first bulb is a rubber tube which envelopes the platinum tube and which projects down almost to the end of it; between these two tubes there is a space. Now, this first bulb is collapsed, the rubber point of the syringe is inserted in this little glass tube and the bulb released. The moment that the first bulb is released the air is drawn out of the glass tube into it, creating a suction which causes the space in the tube to be

filled with the pyrozone solution from the second bulb. If you attempted to force the pyrozone solution into the tube in the ordinary manner, the air pressure would be so great that you would spill most of it and put but a small quantity of it in the tube. The positive electrode which has been devised for this appliance has a clamp which fits around the neck of this glass tube, and comes in contact with the platinum coil of wire. When this has been attached the open end of the tube is closed by means of a stopper. Great care should be taken that the joint between the neck of the tooth and the rubber dam is hermetic; because if it is not the current will be leaking out around the mouth. The negative electrode is attached to the wrist. Now, when all these precautions and these various steps have been taken the current can be turned on very rapidly, because there is not the sensitiveness to contend with that there is in a live tooth. It is said that a current of the strength of twenty-five volts for half an hour will on an average do the work. I am very free to admit that the majority of cases in which I have tried this process I have not bleached to my own satisfaction in that time. I have done it mainly at clinics, where I do not have the opportunity of seeing the cases again. But I know that Dr. Stewart, of this city, succeeded in bleaching a tooth perfectly in that time by this method at one of the clinics. I have had some cases, however, that have been a success. It is said that if a milliamperemeter records more than three-quarters of a milliamperemeter before a twenty-five volt pressure is reached it indicates that there is a leak somewhere, so great precaution should be taken about the joint at the neck of the tooth. After bleaching the cavity the tooth should be hermetically closed by cement and gold.

There is one objection to this appliance, and that is, that it hides the tooth from view while the bleaching process is going on. But in point of fact, many bleaching operations have to be repeated two or three times before fully satisfactory results are obtained. However, it is claimed that the full action of the pyrozone is not evident until twenty-four hours have elapsed, so that when the patient returns later the tooth may be found perfectly bleached, although when you dismissed the case it may have seemed to you to have been a failure. This thought has occurred to me: that probably not all of the cells in a discolored tooth are discolored at one time, and by bleaching out those that have been discolored the tooth

regains its normal color on account of the large majority of cells which were not affected by the discolorizing agent. If it were a fact that all the cells were discolored at one time, I do not believe that you would ever be able to restore the normal color to such a tooth. Consequently you will have some cases that will be failures in spite of all that you can do with them, due probably to the condition I have just spoken of, namely, that all of the cells of the tooth were affected by this discolorizing agent. And even if you succeeded in bleaching such a tooth you would have as unnatural a color as it was before you bleached it. There are some cases in which a rediscoloration takes place owing to the fact that there are cracks in the enamel which allow the absorption of discolorizing agents from the mouth. I do not understand organic chemistry well enough to give you the chemical composition of the various discolorizing agents, or to be able to write out the chemical reaction which takes place between the discolored material and the bleaching fluid; in fact, there are many things about this subject that I would like to explain to you, but I really do not understand them myself.

THE ETIOLOGY OF DENTAL CARIES.*

By D. M. CATTELL, D. D. S., CHICAGO, ILL.

Caries of the teeth is known to have existed before what we call historic times. Caries of the teeth has been known and recognized ever since history began. It is the most prevalent of all diseases known attacking the human animal. In 1754 Jourdain and Bourdet, two scientific men of the times, regarded caries of the teeth as caused directly by "inflammation of the bone" or dentine. Later, John Hunter says it is the most common disease known to the teeth and calls it "mortification and something else."

In 1806 Dr. Fox supposed the cause to be an inflammation of the lining membrane of the pulp chamber, or what we know now as the odontoblastic layer. The inflamed area cut off the circulation in the dentine and gangrene resulted.

Mr. Bell in 1825 considered inflammation of the tooth substance itself was the cause of decay and beginning just under the enamel, then penetrating toward the pulp. The cause of the inflammation may have been a cold or other slight disturbance.

In 1830 Koecker conceived that the portion of dentine killed

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by inflammation was dissolved out by acids, the result of a putrefactive process.

In 1835 Robertson claimed that caries was caused by acids formed by decomposition occurring at the exact spot of the breaking down tooth structure; also that caries always began on the outside surface of the tooth.

Regnard corroborated the claim of Robertson, namely, "the destruction of the teeth by decomposition."

Desirabode claimed that if acids caused caries the whole tooth would go rather than in sections.

John Tomes, the father of the histology of the teeth, proved dentine to be without blood circulation, hence there could be no inflammation, but proposed the chemico-vital theory of decay; that the tooth must lose all life sensation before the decomposition of lime salts. Tomes also gave us "the transparent zone," or zone of resistance, supposing that the pulp in trying to head off the approaching decay threw up breastworks in front of the encroaching enemy to prevent further ingress.

Dr. Bridgeman proposed the electric theory of decay, dissolving away lime salts by the formation and action of electricity.

Dr. Watts' theory (chemical, similar to Robertson) differed some, namely, that caries of the teeth was produced by *mineral* acids, developed at the immediate point where the action was produced, and did the work of dissolution while in their nascent state. The acids proposed were hydrochloric, producing yellow decay; nitric, the white variety, and sulphuric, the dark or black caries.

During the years the last four or five named gentlemen were working on the theory of the origin of dental caries, Magitot, of Paris, was working along lines hoping to find a better cause than any heretofore suggested. He was a faithful worker, and advanced many points to help out in the solution of the work in hand. Just what his final conclusions were, I am not able to state at present.

In the middle of the present century microorganisms began to be seriously connected with caries of the teeth. After 1875, a closer study of microorganisms began, and the different species or nations were studied with more distinctness. In the latter part of the 60's, Leber and Rottenstein discovered that the "granular matter" of Tomes and others were germs in the dentinal tubuli of

carious teeth, as well as in the cavity already produced. But they did not know how closely connected they were with the causes of caries. They also told of a zone of resisting calcific deposit appearing to be thrown up to prevent further ingress of the carious agents. Later, about 1880, Mills and Underwood showed by a new staining process that this supposed "zone of resistance" was also microorganisms, probably of a different species. Dr. Koch discovered a process of staining different species of germs with different colors, and Mills and Underwood took advantage of his discovery. Mills and Underwood proposed that decalcification was the result of acids; that the acids were secreted by the germs and the germs themselves destroyed the organic matter, using it as food. They did not prove the proposition.

About 1881, Dr. Miller instituted a series of experiments and proved that ptyalin had nothing to do with producing an acid condition of the saliva, as had been supposed heretofore, but that microorganisms produced the acid. Miller also proved the physiology, so to speak, of microorganisms: (1) That they had a digestive apparatus, (produced a digestive solvent); (2) that they were nourished, (assimilated food); (3) that they eliminated poisons, (produced acids); and (4) that they had the power of reproducing their own kind. In other words, he proved that microorganisms could take hold of certain materials, change the chemistry of them for their own uses and throw off again the changed material or chemical. Miller proved that the germs produced the special acid that dissolved out the lime salts of the teeth; that the microorganisms fed upon or digested the animal or organic matrix. In other words, the function of the microorganisms in the production of caries of the teeth was proven; also that the particular secretion dissolving the lime salts was *lactic acid*. Miller suggested that the process of enamel decay was similar to caries of the dentine; and such it has been proven to be by Black and Williams, the streptococci media germs forming about themselves a gelatinous substance and becoming attached to the enamel, under which the lactic acid is secreted, dissolving out the cement substance from between the rods, which soon fall out, allowing ingress of microorganisms to the dentine.

Last winter Williams of England read a paper before an association of dentists in New York city on the "Pathology of Enamel," exhibiting the most beautiful microscopic specimens

ever seen. They were so thin, some of them, as to represent only the thickness of a single enamel rod. Many of his specimens showed that destruction of enamel under the influence of micro-organisms was going on long before the naked eye, with the help of a fine pointed explorer, could detect a fault upon the enamel surface. His experiments have proven much that heretofore had only been surmised. Our own Black has done considerable work in the same line and many suggestions and thoughts that have been presented by him from time to time, within the last few years, have now been proven beyond a doubt to be facts by the scientific and positive display of Williams. Indeed, the thoughts and ideas and researches of the two men have been practically the same.

Williams showed distinctively, not once, but many times, that lactic acid may dissolve out the cement substance between the enamel rods, and one or more enamel rods drop out, and through the puncture in the enamel a large area of dentine may be affected, and yet the eye or the sharp point that the dentist may have in the way of an explorer is not able to detect any faulty spot upon the surface of the enamel at that point. Williams' specimens under the microscope showed it very distinctly.

The other questions are soon answered. "Why is caries so much more active in some mouths than in others?" Well, why is the atmosphere in some rooms not so healthy as in others? The moisture or the juices of the body as exhibited in the mouth, in some are more healthful than in others, that is, they are not so corrosive, not so active, and it is the *surroundings* of the tooth that influence its destruction, nothing else.

"What changes take place where caries ceases its activity in mouths heretofore predisposed?" If we *know* what changes, we would apply the remedy and *cause* the change in all mouths immediately and stop further decay. *We do not know it; we will not know it for some time to come.*

"Are there recognizable signs by which we can know whether or not caries will cease with advancing age?" Most decidedly not. We cannot prognosticate in that direction yet. If there are signs, we do not know them. In some mouths we find almost perfect teeth, but little decay. Where we would suppose from the general appearance of the patient that we would find rapid decay, the teeth are perfect. We find individuals strong and healthy

to all appearances, robust in every way, with their teeth softening and dissolving rapidly. In mouths where we find the thin saliva without odor, which we would call from a physical examination, pure and healthy, the teeth are being dissolved rapidly. Again, in persons whose saliva is ropy, and we would suppose that it would be very deleterious to tooth structure, we find well developed, strong teeth that are not carious. In fact, we know a few things, and a great many other things we do not know.

REPORT OF A CASE OF CARCINOMA OF THE BUCCAL MUCOUS MEMBRANE WITH MICROSCOPIC EXHIBIT.*

By GEO. J. DENNIS, M. D., D. D. S., CHICAGO, ILL.

In presenting a report of a cancer of the cheek it is not with the idea of presenting anything new, or unusual; but it is done because of the interest of the case to the writer, and because he believes that a description of the case and the operation for the removal of the tumor will be of interest to the members of this society; sufficient at least to serve as an excuse for the presentation of a case, and an operation at which he was only a spectator and not an active participant.

The operation for the removal of the tumor was performed at Wesley Hospital by Dr. Wm. E. Schroeder, of this city, assisted by Dr. S. C. Plummer, and it is through Dr. Schroeder's kindness that the patient and the microscopic exhibit, are here this evening.

The report is as follows: Mr. R., age fifty-four. Family history, negative. Personal history: Habits: Uses tobacco moderately, smokes occasionally, chews on the left side and drinks alcoholics very moderately.

Previous diseases. The usual diseases of childhood, scarlet fever, measles, etc., and one attack of pneumonia. Otherwise has always been well.

Present illness. Began three and one-half months before the operation in the form of a small swelling in the middle of the right buccal mucous membrane. It grew rapidly with little pain and soon ulcerated. The odor from the mouth increased as the growth increased. During the last few weeks the patient noticed a swelling under the lower jaw.

*Read before the Odontographic Society of Chicago, October, 1897.

Examination. In the right side of the mouth a tumor, about three-quarters of an inch below the opening of Steno's duct of the size of a silver dollar, extending downward and involving the mucous membrane of the inferior maxilla. The surface was ulcerated, the edges indurated and irregular. Under the right inferior maxilla several glands, one of which was the submaxillary lymph gland, were palpated. The cervical glands were not enlarged. Glands on the opposite side were not enlarged. Submental glands were also negative. Of the teeth, the second bicuspid, first and second molars were missing, the others in good condition.

Physical examination, negative; the patient somewhat cachectic. Urine negative. A specimen was removed from the border of the tumor hardened in alcohol, formalin and water for six days, mounted, sections cut and stained. The microscopic examination revealed an alveolar carcinoma.

Preparation for operation. Consisted of a mouth wash for one week of a saturated solution of boric acid; on the day before the operation the patient was scrubbed, washed and shaved about neck and face; a wet boric acid dressing applied and only liquid food permitted.

The operation. Anæsthetic, chloroform during the early stages followed by ether, with a return to chloroform at the close.

To avoid paralysis of the facial nerve, the lower lip was split in the median line between two Billroth forceps to the lower edge of the chin by means of scissors and the incision carried on a line parallel with the lower border of the jaw to a point about three-quarters of an inch from the mastoid process. The hæmorrhage was arrested by tying the facial artery, veins and branches. The side of the cheek was then lifted, and the tumor and neighboring tissue three and one half by two inches removed, the incision being carried about three-fourths of an inch outside of the mass and as high as Steno's duct. The third molar, first bicuspid and cuspid were extracted, and the mucous membrane of the outer portion of the jaw and the alveolar process were removed. The hæmorrhage from the jaw was stopped by means of the Paquelin cautery. The submaxillary lymph and salivary glands as well as all the other submaxillary glands were then removed because adherent. The submental glands were searched for, but none were found. These are not always present (Henle).

A measure of the denuded surface was then taken with gutta-percha tissue, and a flap was dissected from the neck and infra-clavicular region leaving a pedicle sufficient for the nutrition of the detached skin. After this the flap was carried up and stitched into the denuded area of the cheek. The cheek was then brought forward to place and the first incision through the lip and along the jaw was closed by interrupted sutures, except that portion through which the flap from the chest was carried. Retention sutures were applied to the denuded area over the chest to diminish the wound as much as possible and the remaining uncovered surface received a covering of iodoform gauze. The wound was now dressed aseptically with the head drawn toward the right shoulder to lessen the tension on the flap. The dressings were changed frequently because of the passage of secretions from the mouth between the flap and jaw.

Twelve days later the flap from the chest was incised from its pedicle near the opening into the mouth and returned to its place on the chest; the separated portion was carried inside of the mouth and sutured to the mucous membrane at the side of the tongue, and the original opening along the jaw which had been only partially closed was now completely closed. The remaining uncovered surface of the chest was filled in with Thierch skin grafts.

It is due to Dr. Schroeder to state that another operation for the removal of the cervical glands will take place in order that metastatic growths in other parts of the body may be prevented.

PRESIDENT'S ADDRESS.*

BY DR. W. D. JAMES, TRACY, MINN.

It is with pleasure that I bid you, one and all, a hearty welcome to this, our fourteenth annual meeting. In beginning my brief remarks I deem it proper that grateful recognition be made for the rapid strides which dentistry has made in the past, through organization. It is comparatively of late years that dentistry has occupied anything like a properly recognized position among the different departments of minor surgery; for long it was practiced to a great extent as a superadded means of livelihood by persons who were following other pursuits, and without any professional education whatever. This has given away to the advancing forces and in its place we find dental colleges, local, district, State and

*Read before the Minnesota State Dental Association, 1897.

national dental societies, also laws regulating the practice of dentistry in the several States. All of which are the direct result of organization.

Organization is the foundation principle of all societies, for without it there is not that concerted action which is necessary to bring success. Dental societies, like all other societies, have their ups and downs, dark days as well as bright ones.

To-day we can say that dentistry is in a better condition than ever before. This, I think, can safely be placed to the credit of the old stalwarts, who have stood by through thick and thin, never ceasing in their untiring efforts to elevate their loved profession to a higher state of perfection.

The profession of to-day has much to be thankful for. The wisdom and experience of the generation preceding is ours, if we will only accept its guidance.

Never had the human mind such incentives to success as now. Intelligence, culture and refinement are now everyday facts in life; energy and ambition have substantial foundation on which to build; the intellect has simply to appropriate what it hungers for from unlimited sources.

The more ingenuity, the more thought and concentration used in the assimilating process, the greater the results we see.

Circumstances control indications, and a man whose environments are favorable, ordinarily is considered best able to accomplish the greatest results, but the man who is less fortunate in the good things of this life, and accepts the situation as he finds it, accomplishing his plans, is to my mind the more to be appreciated.

Man's inherent right to become superior in his vocation is limited only by his desires and capabilities; for no allegation is more positively proven than that "As a man thinks, so is he." One can rise no higher than his own conception of his possibilities.

Right here I wish to say a few words, more in particular to the young man; do not let an opportunity pass to join an active dental society, two or three of them if you can. You will never regret it, for it is "the bread of life" professionally speaking. No young man can truthfully say that associations are of no benefit to him; for, when a dentist devotes all of his time within his own office he simply subsists upon what stored knowledge he possessed when he left college. Every one of a social nature, naturally enjoys the society of his friends and neighbors, but the dentist who

would rise in the profession must read dental journals, attend dental meetings, write papers on dental subjects, discuss other papers, and become active in the work. If he does not thus assist his associates he is the one who suffers most.

All should go to society meetings for the good of the cause, to acquire all they can and to give to the others what new things they may have themselves.

The sooner dentists in general realize the necessity and advantages of societies and society work, the sooner will the profession reach that higher state of perfection which we are striving for.

At our last meeting held in Winona it was decided to hold this meeting at Minneapolis, or at one of the lakes contiguous to Minneapolis, the place to be decided by the executive committee. At our meeting which was held the first of February we decided that it would not be advisable to hold the meeting at the lakes, as there were no conveniences there for holding our clinics also three of our executive committee would be busy at that time in their college work. The committee has prepared a program which I hope may prove interesting and profitable to you all.

I wish to place before you, for your consideration, a matter of great importance to us as dentists, viz.: Shall we ask Congress for a special law regulating medical and dental patents?

The New York Dental Society asks each State society to co-operate with it by appointing a committee, whose duty it shall be to bring to bear the influence of the profession in its own State upon the congressmen and senators, when the bill is finally formulated.

In the past there has been quite a difference of opinion on the question of patents, one class contending that a truly professional man would not ask for a patent. The other class claim that it is only just that an invention, which has cost time and money, should be protected by a patent.

The two elements are at war on the subject of the patentability of modern invention in dental surgery. The conservative element claims that under the code all inventions are for the good of humanity; that the patent is a restriction and therefore humanity has to suffer. The other party claims that a laborer is worthy of his hire, and that if a man spends time and money in perfecting an invention he is entitled to a liberal compensation for his labors.

There is still another class of patents, and that is the class we are to consider, viz.: The patent which protects a certain mode of procedure in making an appliance or operation. Where simply a set of rules or directions are furnished, the present law allows the patentee of a process to say you must pay me a fee if you wish to use this process. Is this just?

Our government says that you shall attain a certain degree of proficiency before you may practice dentistry. This costs a great deal of time and expense. Now in the name of justice, is it right for us to be restricted in using our own best judgment and skill in the treatment of the case in hand? The Dental Protective Association has done a noble work in fighting this class of patents.

Can we not go a little further and strike a blow at the root of the evil by asking our government for protection against this class of patents?

Gentlemen, as your retiring president I wish to thank you for your attention and the interest which you manifest in the affairs of our association.

• PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held June 1, 1897, the President, Dr. A. H. Peck, in the chair.

Dr. J. E. Nyman read a paper entitled "The Bleaching of Discolored Teeth."*

DISCUSSION.

Dr. J. H. WOOLLEY: I would like Dr. Ames to answer the question why, after a tooth has been once bleached it does not remain so.

Dr. AMES: I wish I could tell a whole lot of things that Dr. Nyman did not feel equal to enlighten us upon. I do not know why these teeth return to their original bad condition, unless it is that the tooth substance is porous, and by the infiltration of the fluids, the same process is duplicated. I have tried to ascertain a few things in regard to the bleaching process, especially since we have been doing so much recently with electrolysis, and I run against all sorts of snags. I have tried to formulate some general rule on which oxygen ought to bleach different materials, and I

*See page 824

am in Dr. Nyman's position, I am not enough of a chemist to account for things that do and do not happen. I would like very much to be enlightened.

Dr. A. W. HARLAN: The bleaching of the teeth out of the mouth by electricity is one of the accomplished facts. Teeth thus bleached remain so, but if you surrounded them with the same conditions that we had in the mouth they would rediscolor. If I had any theory to offer with reference to the removal of discoloration from teeth, it would be that in order to bleach the tooth you must render the coloring matters soluble and wash the coloring matters out and then the tooth is bleached, and that is not always accomplished even with the liberation of the oxygen. The sulphur dioxide, the sulphurous acid process that was mentioned by Dr. Nyman, theoretically furnishes one of the best processes for rendering coloring matter soluble, but in practice it does not work so well. There are a number of methods of bleaching fabrics, feathers, bone, etc., that are not applicable to the teeth, and it seems to me that when we have a badly discolored tooth with fractured enamel on the labial surface, that it would probably be better to cut it off and put on a crown than to bleach it; although we may succeed in bleaching it, we may not be able to keep it bleached. I think one of the faulty things in operating on discolored teeth is that we do not protect the interior of the tooth with any cementing or coating solution and protect the crown of the tooth for a sufficient length of time after that has been placed in, to more or less render it water-tight, theoretically speaking. Out of the mouth I have been able to line the inside of the teeth with melted clear liquid paraffin, and then protect the outside, keep it dry for a few hours and afterward drop it in saliva that has been collected and it does not seem to rediscolor, but probably saliva itself does not contain the fermentable particles necessary to rediscolor it from the outside. If this method of bleaching attains any degree of certainty, some process of lining the interior of the tooth, which will make it absolutely impermeable, is the next thing that has to be done in order to keep it in that condition.

Dr. AMES: I want to compliment Dr. Nyman on the start he has made at least. I think he has gone at this thing in just the right way. He is getting at the cause of these discolorations, and is I think in a fair way to formulate, if possible some reliable process.

I thought I had the pig right by the tail a dozen years ago when I bleached teeth by electrolysis, but I now do about as Dr. Harlan does, cut them off. What I got up to say was that I am afraid Dr. Nyman is wrong about the Sanger case. You can produce chloride of gold by using the electric current, decomposing sodium chloride in presence of gold.

Dr. NYMAN: He did not use the electric current, he just bleached it by the ordinary chlorine method.

Dr. NOYES: I would like to ask Dr. Ames if he does not consider the chlorine method of bleaching as simply a method of manufacturing oxygen, that is, in treating the teeth according to the chlorine method, it depends on the moisture of the teeth, the free chlorine manufactured taking the water and giving free the oxygen which does the bleaching, so that the chlorine method so-called, and the oxygen method so-called are really the same thing, only different ways of putting the oxygen where you do the work.

Dr. AMES: Yes, that is what Dr. Nyman said.

Dr. NYMAN: In my paper I stated that chlorine belonged to the oxidizers.

Dr. CATTELL: I would like to ask the difference between a bleached tooth and a discolored tooth in meaning.

Dr. NYMAN: When I speak of a discolored tooth I mean a tooth that is darker than the rest. If the color is at variance with the adjoining teeth I call it a discolored tooth.

Dr. CATTELL: Who does?

Dr. NYMAN: I do, and so does almost everybody else. All teeth are colored teeth, but one that is not the same tinge as the rest, is a tooth that is called discolored. Dr. MaWhinney from the depths of his Latin knowledge, has just informed me that *ab* means from, down or apart from, so it is a color from the rest, apart from the rest so to speak. I would like to say, when I speak of a tooth that has been bleached, I mean to refer to a tooth that was discolored, in which the discolorizing compound that has been bleached by the bleaching process and to which the normal color is again imparted by the cells which remained unaffected by the discoloring agent.

Dr. CATTELL: According to that definition you have not any bleached teeth, bleaching means taking all the color.

Dr. NYMAN: That tooth is bleached in so far as I have

bleached out the cells which were discolored, consequently that tooth can be referred to as a bleached tooth, the same as you would call a tooth fractured, whether the corner is simply broken off or it is split clean up the middle, crown, root and all, it would be called a fractured tooth even if only the corner was split off.

Dr. F. B. NOYES: Dr. Nyman refers, in speaking of discolored teeth, to part of the pigment cells being affected, or more or less of the pigment cells being affected. Now from the structure of the teeth I do not understand what he means by the pigment cells. All teeth that are discolored are without living pulps. Histologically they have no cells at all, pigment cells or any others. The dentine consists of formed matter which has been made by cells. It seems to me that the discoloration of teeth is due probably to two conditions. The tooth structure, the dentine is open, it is traversed by the tubuli; now the tubuli may be filled with a substance which has a color and which makes the tooth a different color from the rest of the teeth in the mouth, because the tubuli are filled with it. To bleach that tooth you must destroy the foreign colored substance which fills the tubuli.

Is there not another possibility for discoloration of the teeth, namely, that the dentine itself has been affected by something, so that it is of different composition, and the resulting compound of the dentine and some foreign substance has a color different from that of normal dentine. It stands to reason that one of these cases would bleach more easily than the other. I think very often you have the tubuli of the dentine filled with blood pigments as Dr. Nyman suggested, may be cause of discoloration, which can be bleached much more easily than in the second condition in which the dentine itself is chemically compounded with some substance which gives it a new composition and a different color. I do not understand the use of "pigment cells" in relation to the teeth in this connection at all. If the dentine is affected by a substance which combines with it it may be more or less deeply affected, but it is a homogeneous substance which is affected, and not individual cells. Just the same as you may have an ivory billiard ball stained part way through, or all the way through, but it has no stained cells, it has not pigment cells, but it is the staining of a definite substance, just as you have any other chemical substance which is changed in color by combination with another substance.

Dr. NYMAN: Perhaps I have used the term pigment cell a lit-

tle loosely. I should probably have spoken of cell alone. You do not destroy that discoloring matter in the strict meaning of the word destroy, but you make a chemical change in it. As I said before, there is so much of this subject that I do not know that I am perfectly willing to admit that there are all sorts of possibilities that may happen.

Dr. HINKINS: I admire Dr. Nyman for the steps he has taken, but it seems to me everything that he has advanced has been either in the line of chemical composition or chemical equation. I might say this, that I have bleached quite a few teeth and have been successful with oxalic acid as a bleacher, but I do not try to bleach a tooth any more for any one that is under twenty-five; with people under that age the dentine varies more or less in its density and I have had better results bleaching teeth for people over twenty-five.

I have had a good many cases of discoloration coming back under the age of twenty-five, and what I have attributed that to largely was the fluids which surround the root of the tooth. Whether the arterial pressure would be sufficient to force the blood through the cementum into the dental tubuli and then into the crown of the tooth, and producing oxidation of the blood in the dental tubuli and thus discoloration of the teeth, is a question that must yet be determined.

Dr. NYMAN (closing the discussion): Of course electricity in this case is merely a means to an end; the actual work is chemical, the discoloration is chemical. In regard to why teeth sometimes rediscolor, sometimes you will find that the enamel of a tooth is so badly abraded that there is quite a little dentine exposed at that point. Then, too, we sometimes have faulty fillings in both crown and root, or either one, that permit a tooth to rediscolor.

Now, in regard to washing out the coloring matter of the dental tubuli, that has always seemed to me more of a theoretical process than a practical one, because the dental tubuli are so small that capillary attraction would resist every effort you might make to wash them out.

In regard to coating the material of the teeth with paraffin, the only trouble with that is that the minute the tooth becomes moist the hold of the paraffin upon that tooth is broken. There is another feature about it, and that is that most of the discoloration is free from some internal cause, from some complication which

arises in the pulp canal of the tooth so it seems to me that there is the place to bleach it, and that there the measures are to be taken to prevent a rediscoloration.

A paper entitled "The Etiology of Dental Caries" was then read by Dr. D. M. Cattell, of Chicago.*

Dr. CRISSMAN: I would like Dr. Cattell to give me the definition of caries, and it would settle my mind definitely on one point.

Dr. CATTELL: It is the destruction of bone or tooth structure in minute particles; the death, I should say, of minute particles. Necrosis is where large portions, or a circumscribed area of notable proportions die, crudely expressed; that is my understanding of it.

Dr. CRISSMAN: I wanted it clear in my mind. If I remember correctly, it was stated that caries is the ulceration of the bone, and if any one can explain that to me in any other way, I want to know. Ulceration of bone is not decay, death of structure.

Dr. NYMAN: He is wrong in regard to the ulceration of bone. An ulcer is the solution of the continuity of a surface with a pus secreting surface, and there is no pus secreting surface in caries of a tooth.

I would like to ask Dr. Cattell whether he distinguished between the destruction that is due to microbes and destruction that does not seem to be. For instance, ordinary caries of a tooth and erosion in which you cannot find any microbes similar to what you find in the carious cavity of a tooth.

Dr. CATTELL: In caries of the teeth the acid produced by microorganisms first attacks the enamel substance, causing death of the substance. Therefore we have death right away. I need not say first, but it attacks that living substance and causes death; there we have actual death; that is, actual death may occur even ahead of the breaking down of the lime salts, or dissolving of the lime salts, but in erosion we have simply an acid condition that penetrates only as fast, or about as fast as it is rubbed or worn away, penetrating no deeper than a file would in cutting it away, yet the distinctions between the two I could not give. Only in caries we have a diseased condition that can be recognized as true death, while in the other it seems to me more as though it were not only erosion, but a wearing away as well. We have had ulcerated teeth, some of them have had two.

*See page 830.

Dr. J. N. CROUSE: I examined a mouth two or three times within a week where the front teeth above and below were worn down about one-third of their length right on the grinding surface; where the patient chewing would polish the surface of the hardest gold filling in a week so that it would look as if done intentionally. The teeth were not filled, but the ends were black and all the dentine seemed to be black. Now it occurred to me as I was working, that the microbe would have a pretty lively time under that fellow's teeth, yet the tooth substance was so decayed and affected that I could readily shave this black portion out with an excavator. Of course the dentine had no sensation in it, but it had substance enough that the ordinary chewing did not cut the black portion much faster than the enamel, and yet there was some kind of destruction of the tooth structure there, independent I think, of microbes. The question of erosion is one that we do not know anything about. The last theory, which seems a plausible one, advanced by some one in Philadelphia recently, holds that it is caused by an inflamed condition of the mucous follicle under the lips in that particular portion. I had some specimens from one mouth in which the erosion, instead of being as it is ordinarily across, grew up and down through the center, and clear up through the pulp cavity. I have seen that patient for twenty years off and on and this has been progressing gradually to where it is now; the pulp has receded and the grooving out is certainly two-thirds of the tooth. I have taken impressions of it at two or three different stages of growth.

Then the other question which needs to be solved or explained away—it has been explained but not satisfactorily—is why tooth destruction goes on so much more rapidly in one mouth than in another.

Dr. CRISSMAN: Was the first case that you spoke of in a male or female?

Dr. CROUSE: It was in a male.

Dr. CRISSMAN: Did he smoke?

Dr. CROUSE: Yes.

Dr. CRISSMAN: Did not that settle the question of that black substance for you?

Dr. CROUSE: It might have settled it if I had not found the same thing in the mouth of a woman who did not smoke. I have also seen this black deposit on the surface of teeth in the mouths

of men who did not smoke. I thought at one time I had the right theory when I attributed it to the use of tobacco, but then these cases presented.

Dr. E. NOYES: Just one word more in regard to the definition of caries and erosion. Dr. Cattell spoke of caries as necessarily being a death of the animal matter, the destruction of the vitality of the tissue before the integrity of the tissue was affected, and he made that as a distinction between caries and erosion. Now it seems to me that that is not exactly a clear way of looking at it. I regard the distinction between caries and erosion as fundamental, that is, in caries you always have a softening of the surface attacked, in erosion you never have a softening of the surface attacked. In caries you always have first the inorganic portion of the tooth substance attacked and dissolved out and the organic used as food by the microorganisms. In erosion the surface is always perfectly hard.

In regard to the etiology of dental caries it seems to me that we can regard the subject as standing in a negative position.

To look back over the history of dental caries it has had several other such periods before. It was first suggested that the destruction of the tooth substance was due to acids, then that the acids were formed at the point attacked, and the question was asked, where do the acids come from and what are they?

In this position the knowledge on the subject stood still for years, until the development of science in regard to microorganisms was sufficiently advanced to prove that the development of the acid was due to the vital action of microorganisms at the point attacked.

That caries of the teeth is due to the action of microorganisms, it seems to me, has been proven and is established ground, it is no longer a theory but a fact. We have come again to a negative position which is perhaps stated in this way. What modifies the action of the microorganisms so that in one mouth they attack the teeth, in another they do not; they exist in all cases. In the same individual, at one time they attack the teeth, at another they do not. That microorganisms destroy the tissues we know, but why in one case where we would expect them to, they do not and in another where we would expect them not to, they do, we do not know. So much we know, so much we do not know.

The work of Dr. Black and Dr. Williams shows that the re-

sistance of the teeth to caries is not due to their chemical composition, nor is it due to the perfection of their histological structure, but that it must be due to their environment, the conditions surrounding the teeth which affect the vitality of the microorganisms, or their action in some way. In regard to these modifications of action we know nothing as yet, that subject is to be developed. We stand in a position to ask questions, not to answer them. The questions can only be answered by work, and that work has not yet been done.

Dr. G. W. Cook: In speaking of the attacks of microorganisms on tooth structure in different mouths, I think we might say that it is due to the culture media in which these microorganisms grow. In some mouths you find microorganisms in great abundance and very prolific and growing very luxuriously; in other mouths they do not grow, and their toxic substance that they throw off has been proven to be due to their culture media in which they grow.

In typhoid there are many cases in which the typhoid bacilli pass over the intestinal tract without disturbing the functional organs of the body in any way, and in other cases it does attack and destroy the vitality of the membrane and it is so I think in the mouth. The time is not far distant when perhaps we will be able to cultivate all microorganisms in the mouth and determine their action and their effects. There are some microbes, those that are destructive that are causing dental caries, which will not grow on the present culture media that is now in use, and the thing that is to be done is to produce these artificially and find out what their destructive properties are. It is a question of considerable speculation in regard to whether the microorganism attaches itself to the teeth and produces a substance that destroys the enamel rod or the cement substance, or whether it is due to an acid formed, and the microorganism afterward attaches itself. I have not read very much of Dr. William's experiments that Dr. Cattell spoke of, but I have been doing some work in that line myself, and I am very much inclined to believe that the destruction of teeth is due to an acid that comes from decomposition.

In cases of diabetes mellitus lactic acid is derived from a decomposition of grape sugar and disintegration of tooth substance in full progress, the first that is known of a diseased condition in the mouth.

Dr. E. LAWLEY YORK: It has struck me that the prevalence of caries in some mouths might be attributed to the conditions of the secretions; in mouths that are markedly acid like my own, caries would be seldom or never present. I base my theory on the fact that in artificially cultivating microorganisms one of the most essential things is to have your culture media faintly alkaline; if at all acid the growth of the majority of organisms is retarded.

Dr. NYMAN (closing the discussion): In regard to the remarks that Dr. Crouse made, I am reminded of a remark made by Dr. Black. Somebody stated that he did not think that a crevice of one one-hundredth part of an inch would cut any figure in the recurrence of caries alongside of a filling, and Dr. Black made this remark, "that a crevice which was hardly visible to the naked eye would be large enough for microbes to march in one hundred abreast," and it may be that the surface of teeth which may appear perfectly smooth to the naked eye are a veritable mountainous country to the microbes resting there.

In regard to the remarks that Dr. York made. I have a patient whose teeth are nearly driving her and myself crazy. In spite of the care bestowed upon them, both caries and erosion are working destruction in her mouth, and I cannot find a trace of an acid condition. I have not only tested the saliva in her mouth, but I have inserted the litmus paper slips under the margin of the gum right below the carious portion of the tooth, and I could find no acid reaction. I had a very peculiar case about a year ago; a gentleman was suffering a great deal with the molars on the left lower side, and I found he had cavities in the roots of those teeth that were something enormous. The enamel crowns of those teeth were perfect, but the gums were withdrawn to a point about half way up the roots, and the roots themselves had enormous cup shaped cavities and he told me that every day for the last twenty years he had carried a wad of tobacco right in that spot. I would like to know whether any other gentleman here has had a similar experience.

CHICAGO DENTAL SOCIETY.

A special meeting was held June 22, 1897, with the President, Dr. A. H. Peck, in the Chair.

A paper was read entitled "The Relative Value of Filling Materials," by Dr. C. F. Hartt, of Chicago.*

DISCUSSION.

Dr. EDMUND NOYES: *Mr. President and Gentlemen:* I have not been able to make any considerable preparation for this discussion, and can only give you what I know from experience and observation in my own practice. I am inclined to take hold of the question at the other end from what the essayist did, not because it is better to do so, but because I have been in the habit of doing so, and to say that gold, in my judgment, is incomparably the best material that we have, and in my own thought and habit it stands away at the top. The first thing to be thought of and considered, and when a tooth is to be filled, if I do not fill it with gold, I feel called upon to determine in my own mind the specific and definite reasons for excluding gold in that particular case, which naturally and on general principles would be the thing to use. The reasons why it stands first in my estimation are chiefly that it fulfills the mechanical and physical requirements and possibilities of a filling better than any other material used for that purpose. It admits of definite and accurate handling. It can be put against walls and margins and consolidated and finished, so that we may be reasonably sure of the mechanical results we have obtained and of the permanence of the material we have put in there. The question of permanence after a thoroughly good operation has been made with gold relates to the teeth and surrounding circumstances, and not to the material itself, and in my opinion the mechanical perfection of the operation is so much more important a factor in their durability than any other question relating to the material of which they are made, that such considerations in relation to them cover a great deal of ground and are of the greatest importance. The skill required, the time that it takes, the severity and strain of the operation upon the operator and patient are serious difficulties and objections to the use of gold; but in my own experience the results to be obtained are sufficient compensation.

Probably the second in importance of materials is amalgam, con-

*See page 759.

sidering the range of its use and the amount of service which it must be depended upon to perform; but the material has been so uncertain, and the results that could be gotten with it have been so unsatisfactory as to give to many of us a feeling of discouragement and distrust and regret as we think about the material and the history of the operations that we have made with it, and that we have seen that others have made with it. After all that can be said against it the fact remains that there is a vast field which it must occupy in the future as it has done in the past, and however many times it is and has been used when gold should have been employed, there still remains in the hands of almost all operators a multitude of places in which it is the best thing that we can use. There are a good many things that enter into the question of a material to be put into the teeth besides the absolute one as to which we could make the best operation with if we had a block of dead or inanimate matter under our hands and unlimited time and compensation available. There are other things that must be considered, and these will very often turn the decision toward amalgam instead of gold. I think there are some quite erroneous notions generally prevalent in regard to the skill and knowledge that are required in the handling of amalgam as compared with gold. It is true enough that teeth can be filled with amalgam, that cavities can be shaped and the material mixed up and put in there with the exercise of incomparably less skill or knowledge than it will take to make a gold filling which will be as presentable and look as well any time during the first month after it is inserted. But to command all the possibilities of the material, to be sure of avoiding all possible errors in the use of amalgam, is a task which very few men have ever accomplished, and is an incomparably more difficult one than in the case of gold, because with gold the conditions of success are comparatively few, they are definite, they can be controlled and understood. With amalgam they are very many, they are exceedingly variable, exceedingly difficult to understand and to control, and there is not one man in a hundred—I guess not one in a thousand, I know I do not myself—who comprehends the nicety and accuracy of treatment from the first step in the manufacture of the alloy to the last finishing of the filling, which are necessary in order to get out of amalgam what ought to be gotten out of it, so the skill and knowledge required are really greater, if we are ever to get the best results the material is supposed to be capable of,

in the case of amalgam than of gold. I do not think we have made much progress yet toward the making of amalgam fillings as they will be made some day or other. It is constantly said that in average conditions, under average operators, large amalgam fillings will preserve the teeth longer than gold will, and sometimes it is attributed to the ease with which it can be handled, sometimes to the antiseptic or therapeutic quality of the material, and sometimes to the average imperfection of the gold fillings that are usually made. My own observation and experience go to show that gold fillings will preserve the teeth much longer than amalgam fillings. My books will show that so far as my own practice is concerned, I won't claim that would be an important contribution to the solution of the whole question, because I know that I have not done the best possible amalgam work, although I have tried hard to learn how to do it. In a majority of cases in my practice, teeth filled with amalgam have required refilling sooner than teeth filled with gold under apparently similar conditions, and the cases in which I have been able to use gold throughout the mouth to the exclusion of amalgam, and those in which the use of amalgam has been most closely restricted, have been the most successful.

Something was said in regard to the color of gold as being the most objectionable of all the filling materials in use. In comparison with amalgam the color of gold is vastly preferable. If there are any exceptions they are very rare and uncertain. The color of gold in the front teeth is objectionable enough, so objectionable as to raise the question of the propriety of sacrificing the crown of a tooth in some instances rather than to disfigure it so much, yet, notwithstanding all that, gold, with the modifications of its color which are possible by the mixture of platinum, is less objectionable in the matter of color where it is exposed in front of the mouth than any other permanent material of which I know except porcelain. There are materials which are temporary in their essential qualities that are better. It is somewhat difficult for me to say just what the relative position and value of the cements should be; they fill a much larger place in my own estimation and in my own practice than they did until within a few years. I think I can handle them better than I used to, though I am willing to admit that some of the fillings that we see from across the water, as has been suggested already, appear to

show a durability which I cannot depend upon in the use of cements myself, and in my own experience the uncertainty in respect to them is one of the most serious objections to the frequent use of them. In some instances they appear to last from three to ten times as long as fillings made with equal care, so far as I am able to judge, under circumstances which to any ordinary observer appear similar. The differences in durability have usually been in different mouths rather than in different places in the same mouth. I am unable to tell, when I see a mouth, whether it is one in which cements will last two or three, or four or five years, or whether they will be gone in half a year. It is the uncertainty of the material, especially if out of sight, which is most objectionable to placing any dependence upon it.

Notwithstanding that, there are a good many instances, chiefly for young people, in which it can be made to carry teeth over from one to four or five years, with perhaps several repetitions, if necessary, and be of better service and offer a better prospect of permanent preservation of the teeth than any other treatment of them that I know of. I hope we shall some day get a cement upon which we can depend as a permanent filling material.

The question of relative values and just how to form judgment in regard to the materials that ought to be used is not an easy one, and I do not feel very sure of my ground in regard to it always.

I will say a word or two in regard to tin. It was alluded to, and it seems to me it is a neglected material, though it must be admitted that the field for its application is a very narrow one. It will not wear sufficiently well to resist continued mastication for many years, and it is not hard enough and strong enough to stand up under the force of occlusion and mastication for corners, and it is very difficult in my hands to put into a small proximal filling so as to obtain a good result. I used to put tin in proximal cavities frequently, and was so disappointed in regard to many cases that I practically quit using it. To-day I happened to have in my chair a tin filling in a mesial cavity in a lower molar that has been in place eighteen years, and is good, except a little defect near the grinding surface, which I cut out and made an amalgam filling in the occlusal surface going over the tin. It was perfect in every other part of the whole margin, and the surface of it perfectly black but in good condition. This is one of the exceptions. In my practice tin is almost restricted to the filling of occlusal cav-

ities for children too young to be subjected to the thoroughness of putting in desirable gold fillings which we would expect to last a lifetime. Tin in these cases will preserve the teeth for may be three or four and even seven or eight years sometimes, until the children grow up; the tin wears out, and we are ready for gold operations that can be depended on. I make gold operations in such cases for younger children than some dentists do, depending almost entirely upon the tractableness of the child. For instance, I do not feel afraid to make a gold filling in the occlusal surface of a lower or upper second molar for a boy or girl twelve or thirteen years old when the tooth has just come through sufficiently to be got at to make the operation, if the child is not worried by it. In my own mind it is a question of the practicability of the operation rather than the age of the patient or character of the tooth, and I have not observed gold fillings made under such circumstances to be less durable than those that are made for patients who are older. There are a great many cases in which tin is an incomparably better material to put into these cavities than amalgam for temporary purposes, and there are a good many occlusal cavities in the teeth which have no antagonists, in wisdom teeth where the force of mastication is small, etc., in which tin will make just as good a filling as gold, and be just as durable. That, in my hands, is about the limit of its application.

Dr. C. N. JOHNSON: I shall not detain the society very long. Many of the things I had intended to say have been said by others in a more systematic manner than I could have said them. The subject of the relative value of filling materials, it seems to me, relates more particularly to the individual requirements of each case than any other one thing. As an illustration of that, I had a patient to-day for whom I did some work, and I want to say a word or two about her, because it is an extreme illustration of the point I just made. It was a young girl, brought to me by her sister, who said that they had practically given up the idea of having her teeth attended to on account of the fact that she positively would not permit any dentist to work on her mouth. She had been to several different dentists, and she was such an uncontrollable individual that no dentist would be bothered with her. I do not blame my fellow practitioners for the ground they took in the matter. The girl comes from a good family and ought to have some sense. But in all my experience I have never seen such a combination of pure

cussedness in any patient as was concentrated in this girl. Her teeth were in bad condition. There was only one filling in the mouth, and that was an amalgam filling on the mesial surface of a lower molar and was not well inserted. But it was a marvel to me how it was inserted as well as it was. She was not ordinarily a nervous child, but the moment she took the chair she was apprehensive, not because she had been hurt previously, but had heard stories about the pain inflicted by dentists, and did not endeavor to have the least control of herself. She was not one of those individuals with whom one could reason. I have been ordinarily successful in managing children of a nervous temperament, but when I began to work on that child my first impulse was to dismiss her as the other dentists had done, and was on the verge of telling her to get out of the chair. Then the thought struck me that if I let her go, her teeth would be lost, for I felt sure they would not take her to any other dentist. So I resolved to put all my ingenuity into the case, and manipulated her as gently as I could, biting my lips a good deal of the time to keep back the censure which I felt like giving her. At the final sitting to-day I have controlled her to the point of doing definite work upon her teeth. Now, Mr. President, the point I make is that gold in such a case has no place as a filling material. The most valuable filling material I know of in such a case is cement, because it was the only material that can be used. I defy anybody to prepare those cavities sufficiently to use even gutta-percha. Cement will stick where gutta-percha will not. I filled all of these teeth with cement. I have made an impression on that child and she will come back in the fall when I shall do better work for her.

Then there are cases where gutta-percha is a most valuable filling material, particularly on the buccal surfaces, where decay is extensive and the patient is not in a physical condition to withstand the insertion of gold. Take a large cavity in a molar or bicuspid, where the periodontal membrane is in a bad condition, where the patient will not submit to the mallet, and amalgam is a valuable filling material. Tin is a valuable filling material in its place, and so on. But when it comes to the intrinsic merits or demerits of the different filling materials in themselves, there is no one material in the whole category which is worthy of being mentioned in the same sentence with gold.

Gold, where it can be used judiciously—and it can be used in

very many places where it is not used to-day is the most reliable, the most definite in results, the most serviceable, the most permanent, beautiful, cleanly, and the most artistic filling material that we have. It draws out the qualities that an artistic dentist should possess. You can rely upon gold, so far as the material itself is concerned, and it is better than any other material with which to fill teeth. It is not dissolved out by the fluids of the mouth such as the cements are; it is not worn down by attrition like gutta-percha; it does not change its color and discolor like amalgam, and it withstands mastication better than tin. We must employ judgment in its use, but when it comes to the discussion of the intrinsic merits of filling materials gold is by all odds the best.

Dr. C. P. PRYX: I think it would be proper to begin my remarks by saying with Dr. Johnson, that my predecessors have covered the ground so thoroughly that there remains very little for me to say. The relative value of filling material depends largely upon the individual using them, and the conditions under which they are used; and while I agree with Dr. Johnson relative to the value, beauty and intrinsic worth of gold, there are other filling materials that are very valuable to us, and they should not be decried because they are sometimes badly or carelessly used. I allude particularly to amalgam. Amalgam has a valuable place in dentistry, and its particular value to me appears to be in a combination of the two metals, gold and amalgam, in the same tooth. Which is the better of the two, is a hard matter to say. We might use an illustration of this kind: Which is of the greatest importance in the propagation of the human species, man or woman? Neither complete without the other. Which is the better of the two, gold or amalgam? When the two are used in combination they fill a field of usefulness that neither one of them fills alone. This is my honest belief. This is a belief that comes to me from an experience of nearly twenty-five years in the practice of dentistry, and for twenty years in this particular line of practice. Take, if you please, extensive decay on the distal surfaces of bicuspid and molars; fill such cavities with amalgam; at the succeeding sitting fill the crown portion of the cavity with gold, so that the two metals may be in complete apposition, and thus no electrical energy is generated to any appreciable extent. After a short time the baser metal will become oxidized, in most cases, beautifully ebonized, the pure metal will be kept bright and clean,

the edges of the amalgam filling will have a much better appearance than if the amalgam was used alone because of the oxidation of the baser metal. So that in my practice I warmly advocate the use of the combination of gold and amalgam in the same tooth. Be sure to have the two metals in apposition. By following this line of practice the amalgam is placed at the cervical borders, where it exhibits its greatest usefulness, while gold will do its best work on the occlusal surfaces, as an illustration we have here, two valuable members of society, each one having its particular position in society where it can be of the most service.

The greatest failure of gold occurs on the cervical borders, and amalgam on the surface. Now by putting each one where it would be at its best, we can do better work than with either one of the metals alone. I frequently see such fillings that have been in the mouth twenty years doing good service to-day, and I feel sure that I am saving with this method of practice more teeth than I could do with the use of either one of these metals separately. It took me a little time to become a convert to this theory, but after consulting some of the old practitioners who had followed this plan for some years, I saw in it a field of usefulness. I have made a great many converts among my professional acquaintances, who have carefully observed the results of this line of my practice.

Some twenty years ago or more we were startled by a new departure, a new theory, as some of you remember. There was a triumvirate in this country, consisting of Drs. Flagg, Palmer and Chase, who said that gold was the worst material to use, and that as teeth needed saving amalgam was the best thing to use. It startled us. It came to us "like thunder out of a clear sky," and we began to investigate a little to see whether there was any truth in this wild vagary. As we examined into it we found there was a grain of truth, and that grain of truth was worth investigating. I am thoroughly convinced that I could hardly use either gold or amalgam and say this is the thing *par excellence*; but I place them hand in hand for the preservation of teeth. I can hardly say definitely and clearly that one of these two is better than the other, because each one has its own particular field of usefulness, and the relative value of each one depends upon its environments and to a considerable extent upon the thoroughness with which it is manipulated.

The other materials, gutta-percha and cements, of course

have a field of usefulness, but to my mind a much more limited one for permanence than either of the two mentioned.

Dr. J. N. CROUSE: I was away from home when the appointment was made for me to exhibit instruments and appliances for testing amalgam at this meeting, otherwise I should have made an effort to have such instruments here. From what little observation I have made in this direction I think it is an important form of clinic, and my idea was to have those who were to be here bring with them the amalgams they use in their practice and fill some of the tubes which I have here, take the readings, and at a later date meet together to examine these readings, and see the result. I have had the pleasure of attending such a clinic at the New York State Dental Society meeting, held in May. If any of the gentlemen have brought amalgam with them, we can have such a demonstration now. I have brought our instruments for making tests simply of expansion, also microscopes.

Recently I began to use the microscope, which was a very valuable thing for me, as it has taken the conceit out of me. When Dr. Black published the results of his experiments, I regretted that he was not able to make a perfect amalgam filling in a steel tube. I said, "He is talking through his hat." But I found he was right. I make the proposition that no one can fill a steel tube with the ordinary amalgam and make a perfect filling. Why? Because until it gets hard enough it will move in applying pressure on one portion, and if you examine it under the microscope you will see that it shifts around like a ball; it does not pack to place, but shifts in its position. I talked to Dr. Black about it and reminded him of what I had said a year or so ago. Until recently I was skeptical about amalgam, and so was a somewhat radical gold filler, and I think I have served my patients better with it than I could have with any other material. Furthermore I am a better practitioner for having done so, because a man who fills teeth steadily with gold must be thorough if he makes a success of it. With amalgam it is hard to tell whether you make a success or not, for out of sixty odd specimens of amalgam on the market, it has been found by demonstration that there is not one which does not shrink more or less; many of them shrinking enough to drop out of the tube in twenty-four hours. It is no wonder we have proven what careful observers have supposed, that there were no perfect amalgam fillings with the exception of

those made with copper amalgam. These investigations point to a change which must be made in all amalgams. We must get rid of the soft plastic amalgam that packs hard and sets rapidly.

I am indebted to Dr. Black for a great deal of the information I have obtained, and I think the dental profession owes him a debt of gratitude which it can never repay. We have reached a point when it is necessary to improve greatly the amalgams that are put on the market, so that if there are constant failures, we will know that it cannot be the material itself, but the individual who uses it. I have sufficient amalgam here to fill four tubes, and I will ask four different dentists to fill them. (The tubes were then filled, during which recess was taken.)

It is very essential to have the proper proportion of mercury and amalgam when you commence mixing. Two ways have been suggested for doing this. One is to weigh out the mercury and amalgam and put them in capsules, so many grains of amalgam and so much mercury to go with it. This method is objectionable because too complicated. The other plan is to have a scale with which the assistant can soon learn to weigh out a sufficient amount for the size of cavity. You soon are able to gauge accurately the number of grains of amalgam that are required to fill the cavity. Be sure to have enough mercury, so as to mix the amalgam to its proper consistency. All amalgams should be mixed softer than many operators think. Some have their amalgams too dry and they do not stand the stress. An amalgam that will stand a stress of from 350 to 450 pounds, if mixed dry will break at 80 or 100 pounds. The mixing of amalgam is so important that it is a great deal better to have it too wet than too dry. There is also such a thing as wringing it out drier than it should be. If it is too dry it begins to powder and hardens before it is in place. I have adopted the method of having it moist, and then take some dry amalgam and incorporate with it.

In regard to the combination spoken of by Dr. Pruyn, if there is any place I desire the very best material, it is at the cervical margins. I fill teeth carefully with gold at cervical margins, finishing the filling before taking the rubber dam off, and so can see whether it is perfect or not. With the amalgams which have been on the market ever since I have been practicing, there is not one of them fit to use at the cervical margins. There is not one which will run uniform and will not shrink. I look for a great

reform in amalgams, since all amalgam workers must prove the value of their amalgam and its staying qualities, or vacate the field. They will be exposed by the testing instruments we have at our command: I shall make tests and determine the results of the different amalgams, by which means I hope by and by better ones will be used.

I was particularly impressed with Dr. Pruyn's combination of amalgam and gold, yet I have never been able to see the correct philosophy of it. It seems to me at these cervical margins I should want the best material obtainable, and if I were to use amalgam and gold I should not be so well satisfied, and should feel that I would have to take out the filling at some time and make it over again.

Dr. HARLAN : Dr. Pruyn says that amalgam and gold is best at those places.

Dr. CROUSE : That may be, but the material which saves the teeth best is gold. I believe every operator will agree with me in that statement.

Dr. PRUYN : I had reference to extreme cases of decay at those places.

Dr. CROUSE : From your remarks I understood you to say that it was your custom.

Dr. PRUYN : Oh, no.

Dr. CROUSE : After all, in my own mouth, in my child's mouth, in the mouth of my best friend, I should prefer to fill the cervical margins with gold, particularly when one has the skill to do it, and I have no doubt that Dr. Pruyn can fill these margins with gold as skilfully as any of us. It necessitates first plenty of space in moving the teeth apart: it necessitates straightening up the wall and cutting it up. On the proximal surfaces, when you get near the gum, you will find a white streak near the lateral margins; if you intend to fill that you must get a straight wall before you can make a perfect filling. I shall feel very sorry when the day comes when noncohesive gold for a certain class of cases is abandoned. For a buccal cavity in a large molar, where there is not much pressure upon it in chewing, where the strength of the cohesive gold is required, there is nothing equal to it. At the cervical margin, to feel absolutely sure, I use three cylinders of noncohesive gold, made of the right length, to extend over the margin, using this as a starting point, then I continue with

cohesive gold. That has been my practice for many years. No one probably has been a more radical gold man than Dr. McKellops, and there is only one material I swear by up to date, and that is gold.

Dr. IRA B. CRISSMAN : In regard to the amalgam which Dr. Crouse advocates, I believe he recommends "No. 1," and I would ask him how long he has used it?

Dr. CROUSE : It is not "No. 1" that I advocate. The amalgam I spoke of I have been using three or four months.

Dr. CRISSMAN : I would like to know on what ground you condemn all other amalgams, as you said a short time ago there was not a reliable amalgam on the market, or that it was unfit for use.

Dr. CROUSE : I believe I said that I have not succeeded in finding a reliable amalgam on the market.

Dr. CRISSMAN : The point I wish to make is this, that Dr. Crouse condemns all other amalgams and advocates his own after three months' test. Now, it seems to me, no man can uphold an amalgam when he has only given it a test of two or three months, because the test is not long enough and is therefore not reliable.

Dr. CROUSE : I do not think there is any difference of opinion between us, except a mistake in the question. Dr. Crissman makes the assertion that I condemn all other amalgams except my own. I have been getting the experience of men for whose judgment I have a great deal of respect in regard to amalgams. I show the amalgam here, not to sell it, but to get somebody to try it and give me their judgment of it. I do say that I have never found an amalgam on the market that I considered fit to use, one that would stand a thorough test. I do not say that my amalgam is absolutely reliable. I have had too much experience and am too old to make any such statement before this body. I hope the time will come when we shall get a good and reliable amalgam, and no one will be more grateful than I, because I get tired of putting in big gold fillings. I would make this one qualification, however, that I should be sorry for the skill that now exists in the dental profession when we could fill teeth easily, but I do not think that millennium will ever come.

Dr. B. H. KEERSHAW : When you have a cavity with horse shoe shaped decay around a gold filling, I understood you to say

that you would not use amalgam on the cervical border, but the best filling material you could get.

Dr. CROUSE: If I used amalgam at the cervical border it would be in such a case as that. If I put in a big gold filling I should probably not feel it was the best thing to do, even in my own mouth, and I would rather subject myself to another operation. I should put myself in a position of the patient in deciding what I would do in this particular case. A good test of any action in life is to place yourself in a position of the patient and see what you would like if you were the patient. While there are cases of this kind where I should use amalgam at the cervical borders, I should not feel sure that I had done the best thing possible for my patient. It is charitable in some of these cases not to use gold, because by so doing you subject the patient to several hours of torture, and so amalgam is preferable.

Dr. LOUIS OTTOFF: So many of the speakers have covered essentially the same ground that I would hesitate to get on my feet were it not for the fact that one important filling material was not mentioned. It was a surprise to me that not a single speaker mentioned it, and which in my opinion ranks next to gold as a filling. I refer to the combination of gold and tin. I will answer this question by giving my opinion of the relative value in the following summary: Perfection, 100 per cent; gold, 90 per cent; gold and tin, 80 per cent; amalgam (excluding copper), 70 per cent; metallic inlays retained by cement or gutta-percha, 60 per cent; gutta-percha, 50 per cent; cement, 40 per cent.

Dr. A. W. HARLAN: The way to estimate the relative value of filling materials is to consider them after a plan something like this: When you use gold for filling teeth, it is gold: it is always gold; it is pure gold, and made by the best processes, manufacturing it into foil or cylinders. It is the same with tin. When it comes to amalgams and cements and gutta-perchas, the Lord only knows how many different people are engaged in the manufacture of these. There is no standard to govern these. There is an absolute, definite mechanical manufacture of both gold and tin foils, but nothing else. The reason why some dentists do better with gold and tin separately or combined is that they have a better material to work with from the very beginning.

Dr. A. E. MATTESON: I agree with all that has been said in regard to gold and amalgam and the places where they should be

used, but there has been nothing said as to the use of the combination of cement and amalgam, which has a very valuable place in my practice. The amalgam is mixed just a trifle softer than for an amalgam filling and condensed in chamois or kid skin.

The cement is then mixed and the amalgam thoroughly incorporated, forming an entirely new combination which has no superior for filling those saucer shaped cavities with frail margins often found in the mesial or distal surfaces of bicuspid and molars.

Having used this combination for more than twelve years, I feel warranted in recommending it for your practical consideration.

In regard to gutta-percha, nothing has been said with reference to using oil of cajeput on the surface of the filling of a cavity before gutta-percha is introduced. It produces a cohesion of the mass of gutta-percha to the teeth and it is very valuable for this purpose.

Dr. J. H. WOOLLEY: I am very glad there is a movement in the direction of a discussion about the relative merits of filling materials. I had hoped that those who are most interested in this work would give us some tabulated reports covering their vast experience and showing the relative merits of gold, silver, and all of the other materials that have been referred to in this discussion. As new interest has been awakened in this subject, I should like to suggest that some evening be set apart in the future for a further discussion of this subject, and that each individual study up his cases and bring before the meeting the results of his operations.

In regard to filling materials, I have made a combination in the way of a temporary filling which in my hands has been very useful, namely, using soft gold near the cervical margins and filling the remainder of the cavity with cement. After a time I discovered that the tooth was ready for a permanent filling; that the gold had prevented any disintegration on the cervical margins of the teeth and decay has not progressed any further, and I have gone on and performed my operation with whatever material for permanency I needed.

Dr. H. A. CROSS: Speaking of saucer shaped cavities reminds me of something which I wish to present to-night for the purpose of demonstrating manipulation. You will remember that Dr. Hewett read a paper not many months ago before this society in which he recommended a certain method for putting in amalgam fillings, and some of you may recall the expression he used,

namely, of "burnishing the amalgam into the tubuli." That attracted my attention, and in my own experience I have found so many cavities where I could not get an undercut, that if there is any method that I can adopt which will enable me to anchor a filling there without the undercut, I shall be glad to learn it. I have been practicing the method described by Dr. Hewett and as recommended by him. I am favorably impressed with it. I have here two small pieces of ivory. I took a bur, made a saucer shaped depression, being particular not to make an undercut, and I filled those with amalgam after the plan recommended by Dr. Hewett, and I would like to hand them to the members here to-night. They will find on the side of the ivory a little depression of the same form as these fillings are placed in. I want them to remove the amalgam as a test for whatever it is worth regarding manipulation, for I think the value of any filling material depends on manipulation. One dentist can put in a good gold filling, while another cannot do it to save his life. As dentists we should experiment with the different kinds of filling materials as well as with the cavities.

Dr. G. W. SCHWARTZ: Considering the manner in which we ordinarily manipulate gold and amalgam, I believe if every dentist were to fill—say twenty teeth—one with amalgam and one with gold alternately, it would be found at the end of five years that the amalgam fillings would be in better condition than the gold ones. Taking all the cases as they come to us—good, bad and indifferent—I believe in the hands of the average dentist amalgam would be the best filling material relatively under these conditions excepting the six anterior teeth.

Nothing has been said with reference to what is considered the best quality of filling material, whether to preserve the teeth from decay or to restore contour. I believe more teeth would be saved by the use of cements and gutta-percha—that is, they will prevent recurrence of caries of the teeth better than either gold or amalgam.

In regard to the use of gold with amalgam, Dr. Pruyn says he uses a combination of the two metals, amalgam and gold. In putting a filling in a tooth that is very badly broken down, as the tooth needs saving, I believe Dr. Flagg says that we should use amalgam, and that the less it needs saving, we should use gold.

There was something said about the use of soft gold, and I

was a little surprised that there was not more said about it, because soft gold at the cervical borders is a good thing. It is here that Dr. Pruyn uses amalgam. I have only used amalgam a few times in these places, and cannot speak from a record kept of my cases, and I will be pleased to have Dr. Pruyn show us some of his work, so that we may be enlightened on the subject, and if it is good for our patients, use it.

I regret that nothing has been said relative to gutta-perchas and cements in a particular way, because I do not see as much recurrence of decay under cement and gutta-percha fillings as I do under amalgam and gold fillings, but a decided loss of contour in the cement fillings.

Dr. D. M. CATTELL (closing the discussion): I might add one or two words regarding the point at issue, and it is this, that the relative value of a filling material depends, in a sense, on the judgment of the operator. For instance, patients go to one dentist to see what he will charge for doing certain work, then to another. The prices of the two men are at variance, and the patient wants to know why. The man who places a less value on his work than the other is just as good a mechanic, just as good a workman; he may insert as good a filling or make as good a crown, etc. The difference in value between his work and the higher valuation is judgment, the exercise of which will, in given cases, select that material best adapted—owing to existing conditions—thereby making the material used of greater value.

One man selecting with judgment, the other not, but both mechanically skilful.

Hence, the relative value of filling materials may be in the line of judgment.

CHICAGO DENTAL SOCIETY.

The regular meeting was held October 5, 1897, with the president, Dr. A. H. Peck, in the chair.

Dr. George T. Carpenter read a paper entitled "Reproduction of Gum Tissue."*

DISCUSSION.

Dr. I. A. FREEMAN: *Mr. President, ladies and gentlemen:* I can sympathize a good deal with the student whom the professor asked to define space. The student thought for a moment and

See page 813.

then said "Really, professor, I have it in my head," and that is my condition to-night. However, the essayist has given us an up to date paper on a very interesting subject. He has given us some very clear and distinct points on what we may term a new topic. As he has mentioned in his paper, there is very little in the literature on the subject. In going over the "*Cosmos*" since 1870 I find no record of any paper or discussion upon this subject. A good deal has been written upon the cause of this condition, but nothing pertaining to the restoration or reproduction of lost gum tissue in any manner has appeared. The essayist has handled the subject in a very unique manner and we are all under obligations to Dr. Carpenter for bringing it before the society and discussing it in so able a manner. I feel we should make this paper a matter of record, because it is, so far as we are able to determine, the first contribution that has been presented to any dental society, at least so far as we can determine by any investigation of the literature of the subject. He has opened up a new field to us, and we have all felt the necessity of something being done toward restoring lost tissues or conditions resulting not only from pyorrhœa alveolaris, but from recession of the gums, caused by what no one is as yet able to determine.

I had an instance in my own practice two or three years since where there was great recession of the gum upon the superior incisors, and it was so bad that I felt an effort should be made to restore it; and I attempted a surgical operation, cutting from above freely and leaving both lateral ends attached, and drawing it down, hoping that it might be held in position so that it would unite, but I failed. There seemed to be very little supply of blood or nourishment, and the parts sloughed, and the last condition was worse than the first. I am aware that others have attempted to perform operations in a similar manner, and have attained very little success.

Dr. Carpenter points out the absolute necessity of protecting the gum tissues as they are being built up. You may see fit to modify or change these appliances a little to suit your own ideas, and probably with increased experience. Dr. Carpenter will also change his methods somewhat, but this is certainly a subject that has been neglected in dentistry, and I am sure that we all appreciate the work that he has been doing. I have some models showing where the gum tissue has been restored after the correc-

tion of the teeth. This has been done by Dr. Haskins, who is paying some considerable attention to orthodontia. I have one model showing the condition of the gum a year after the removal of the retaining appliances, and it illustrates that the irritation caused by one thing or another may restore the lost tissue, and as has been suggested in the paper, a protection is necessary in order that these granulations are not pushed away and destroyed.

I can think of nothing further that I can add to the subject. I am very glad to have seen the models and to have heard Dr. Carpenter's interesting paper. He has previously explained to me the process that he used in bringing about these results.

Dr. EDMUND NOYES: This is a very interesting subject indeed, and one concerning which I can say but very little. The only successful instances of gum restoration in my own observations and practice have been in the proximal spaces after carefully restoring the contour of the teeth by fillings. In cases where they have been either badly filled or long decayed, so that the spaces between the teeth have been such as to cause destruction of the gum, after restoring the teeth their normal form so as to protect the inter-proximate space, the gum has been restored; and this suggests to my mind whether there is not an inherent tendency on the part of gum tissue to grow, which is held down and repressed under ordinary circumstances by the friction of food and the ordinary action which is brought to bear on the margins of the gums, and whether in many instances under the protection of these splints the gum would not grow into the space without positive and severe irritation. Irritation of the gums is something that we must deal with carefully, for it may sometimes destroy gums instead of causing them to grow.

Dr. A. W. HARLAN: The models that Dr. Carpenter has shown to-night seem to me to demonstrate considerable ingenuity and thought, and in many cases the application of such appliances to teeth as described will accomplish very excellent results. I have found in trying to restore gum tissue, where it was uniformly wasted away around the necks of the teeth, that if we take a tolerably stout silk thread and well wax it, and tie it firmly around the teeth, leave it there, it will cause a degree of irritation that will have the gum tissue come up and go beyond the ligature, so that by watching it carefully, keeping the mouth clean, we will be able to produce uniformly a pretty good margin of gum and afterward

care for it antiseptically after the ligature is taken off, and we will find in some of those "symmetrical wastings" that the necks will be very well covered. In other cases I have found that by loosening the gum tissue around the surfaces of the root and making transverse cuts in the gums at regular intervals I could force it down. I can see the utility and desirability of using appliances such as Dr. Freeman has said, and these may be modified to meet varying cases. I think Dr. Carpenter has done a very excellent thing in presenting this paper and the models. The models speak for themselves.

Dr. G. B. PERRY: I would like to ask Dr. Carpenter whether he has ever obtained good results from the use of the toothbrush in producing irritation of the gums.

Dr. CARPENTER: No, sir. I think the toothbrush, where it is used more than once a day, will do more harm than good.

Dr. J. N. CROUSE: I had an interesting case where the gum tissue and alveolar process had wasted away and the patient was going to New York to live, and I turned him over to Dr. Atkinson. In that case Dr. Atkinson produced a new growth of gum tissue by sponge grafting, taking an impression similar to that described by the essayist, and then cut off from the model the amount of tissue that it was desired to have built in to take its place, and afterward using sponge graft. I saw that case a year afterward and the patient was doing well. About five years later the gum tissue wasted away again more or less, and I did not attempt to carry out this process again because the patient was not encouraged by the previous treatment. I have performed this operation in a measure, not using vulcanite, however, but a very light plate of gold. During the last ten years I have not done much along this line because I have been otherwise engaged. In many instances, however, I think we are compensated for our efforts in this direction.

The question of how long the new tissue that has formed will adhere to the necks of the teeth and be permanent, is an open one. It is just in such cases where we have wasting away, we have a low form of vitality. The gum tissue is nonvascular and gradually wastes away. I have in mind at least a dozen such cases that I have had under treatment for some time. If I am able to check the wasting away I am satisfied.

I am delighted to think that this subject has been brought up

in the manner it has to-night, and I hope the practitioners of the city will be benefited by it.

Dr. A. C. HEWETT: This subject is one of great interest to me, and I simply rise to ask a question or two of the doctor for answer when he closes the discussion. First, whether the extra growth of gum tissue connects itself to the neck of the tooth while it is forming, and also covering the crown that Dr. Crouse has spoken of, how long will it remain in that condition?

I think the essayist should be complimented for pursuing this new line of work. Whatever the results may be, the subject is of very great interest to us, and for one I wish to thank him for his able paper and the clear presentation of it in its new light.

Dr. GEORGE T. CARPENTER: I would state that I have never found union between the gum and tooth. The gum will hug the tooth closely and keep out all secretions. We have cases of atrophy of the gum where there is absence of the alveolus and no union. In these cases the gum remains in place for years, although thin, and it does not recede on account of food passing into a pocket. I have reproduced the gum which has remained in good condition for the last five or six years, and perhaps longer. I have also had cases that showed slight signs of recession but stimulating the gum checked the receding. A great deal depends upon the health of the patient. As I said in my paper, we have to deal with some patients in whom it is almost impossible to reproduce gum tissue, while in others it can be reproduced in abundance.

Dr. G. V. BLACK: I am very glad of the opportunity to emphasize some of the things that have been said this evening in regard to this unique presentation. The method strikes me as being an original one in detail, and I would like to call attention to and emphasize several points. In the first place, if I understood Dr. Carpenter rightly, the case must be free from pus formation, must be well. In the second place, the impressions are very accurately taken, as I see from an examination of the models; and the technique in the construction of the splints has been excellent. I should expect that if the technique was not of an excellent character harm would be done instead of good.

I have had some experience in the restoration of gum tissue, and have used the irritation from metals, sharp edges, etc., in order to reproduce tissue, particularly in closing some very difficult openings in the antrum of Highmore, openings that had

become permanent, stimulating the growth of tissue by using sharp edges of metals, which was successful. The difficulty I apprehend in these restorations of gum tissue about the necks of the teeth is the failure of permanence. Where we have gum tissue restored in this way without attachment to the root of the tooth we are very much more liable to have suppuration that will destroy it again. An abnormal pocket between the gum tissue and the root of a tooth is a dangerous thing; so much so that I have often purposely destroyed such pockets by cutting away gum tissue and exposing the root of the tooth, preferring that condition to the pocket. These were cases, however, in which there was a constant tendency to the production of pus. Such a pocket as has been described, that is healthy and free from the formation of pus, would not be so objectionable; yet we must regard it as a dangerous thing. Taking my observations of the restoration of contour of gum tissue, for I have had a good many restorations of contour without mechanical appliances, I should expect, if this gum tissue was held in position and the parts were kept in a healthy condition for a considerable length of time, we would find the attachment gradually creeping up upon the root of the tooth, and we would have restoration of the attachment to that degree. This comes about slowly. I have seen a good deal of restoration come about in the course of a few years' time in this way without any protection whatever. The matter of restoring the gum tissue of the interproximate space is of everyday observation. I have noted this for a number of years in cases where teeth have been decayed, or fillings inserted and the necks had come together, destroying septum. By separating the teeth and holding them in a natural position with properly formed fillings, we see the gum tissue creeping up and filling the interproximate space, provided the patient is young. If the patient is somewhat advanced in age, there is a tendency for the septum to drop down somewhat, or to shorten, and restoration does not occur so readily. But in young patients this restoration takes place perfectly, but slowly; and these cases are assisted very much indeed by frequent stimulation, and as a stimulant for this purpose I regard cassia as one of the very best.

Dr. CARPENTER (closing the discussion) : The main point of my paper dealt with a method of harnessing and handling the conditions which result is the reproduction of gum tissue. We all

know that gum tissue is produced by a process of stimulation and irritation. Dr. Black in his remarks spoke of restoring the tissue of the interproximate space. I think that condition is brought about in the same way that my hoods produce it, simply from protection. Two points in my paper are irritation and protection, and Dr. Black says that irritation or stimulation assists in this work.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

Regular meeting October 11, 1897, the President, Dr. G. B. Perry, in the chair.

Dr. George J. Dennis read a paper entitled "Report of a Case of Carcinoma of the Buccal Mucous Membrane,"* and exhibited microscopic slides.

Dr. G. V. BLACK: *Mr. President and Gentlemen*: It is rather difficult to discuss a report that is so complete in itself as this one is. The paper was handed me this afternoon, and I read it on the train. It brings to my memory a good many cases of like character, and probably the best thing I can do this evening is to speak of this class of cases. They are occurring under our observation continually. The dentist generally sees these cases first. I may also say that they generally pass unrecognized both by dentist and physician until they have attained a degree of virulence, until they have spread to such a degree as to make removal very uncertain of cure. There is perhaps no disease with which we come in contact, the early recognition of which is so very important as this one. Now, if I can say anything this evening that will cause men to think more and study more the characteristics of this disease, which is carrying off many of our people, not so many as some other diseases, but still many, I should like to do so. The difficulty is in the early recognition of this disease. It occurs as a little roughened sore, not very bad, not painful especially, a pimple that goes on for weeks perhaps. According to the history this patient did not notice this trouble until three and a half months before the operation. The probability is that it was in existence for nearer three years and a half; although it may not have been of shorter duration, yet it must have passed unnoticed by the patient for a considerable time. If we could get these cases

*See page 834.

in the early stage, our patients would be comparatively safe. For one who has not been regularly occupied with tumor work, I have had a very wide experience with these growths. Twenty-five years ago Dr. Prince, of Jacksonville, was doing a large amount of tumor work, and in connection with him I followed this class of tumors particularly. I followed this class of tumors as they occurred about the mouth carefully from their inception as nearly as we could get them through the operations and return, and re-operating and re-return of the disease. Some of them were cures, others were not, so that I had the opportunity of following many of these cases until the death of the patients. In this way I have come to appreciate very keenly the importance of early diagnosis of carcinoma, and the importance it is to humanity that dentists should be able to point out the danger that threatens their patients. Carcinoma commences as a little roughened sore that refuses to heal; there is a little bit of induration, a little warty appearance about the mucous membrane of the mouth, about the lip. Mind you, gentlemen, of all cancers that occur in and about the human body more than one-half occur about the mouth. I have followed this disease in almost every position in the body. I have seen it on the extremities, on the wrists, on the hands, the breast, the stomach, and in one case the kidney. It was probably metastatic in the latter case, because there was cancer of the intestines. I have seen cancer involve the uterus, the rectum and other organs. But the greater number of cancers occur about the mouth. In the last operation for this disease in which I assisted my son, he removed one-half of the lower jaw. The operation in many respects was similar to the one detailed this evening, except that it was much more extensive. The lower jaw was removed from the joint to the center of the chin, together with half of the floor of the mouth, making it an ugly operation on account of liability to strangulation by the dropping of the head of the trachea. This case had been a neglected one, in which supuration had taken place through the cheek, discharging upon the outside. It was not expected that the patient would receive more than temporary relief; but the old gentleman is still alive and will not die young, for he was eighty-eight years of age when the operation was made. But the last I heard from him was that another sore had occurred close to the ear, showing that recurrence had taken place. Recurrence is very much more frequent when the

tumor is situated upon movable parts. The motion of the tissue involved seems to have an influence in spreading the elements of the cancerous affection.

Another very peculiar phase of this disease is that the epithelial layers, so to speak, of the cancer sometimes disturb and displace each other, making a condition in which recurrence is liable to take place on account of the opportunity given for the spreading of disturbed cells by floating away with the lymph streams. I remember a peculiar case of that kind, operated on some twenty years ago by Dr. Prince. I made sections of the growth, studied the case, and found this condition. Meeting Dr. Prince a few days later, I inquired about the condition of the patient. I said to him, "Doctor, you need to keep close watch of that case, for I think the disease will recur." The tumor was situated on the face at about this position (Illustrating) near the eye, not upon a movable part. Dr. Prince said to me, "I think it is one of the safest operations I have made." But it was not more than three months when he telephoned me, asking me to come to his office, and I found the patient there with a recurrence of the tumor. It was only then he asked me how I had come to the conclusion that that particular tumor was liable to recur, and I said it was on account of one portion of the growth breaking up another portion of the cancerous tumor.

I have removed these tumors from the lips and other portions of the body. I have removed them from the cheek, etc., cutting wide, and I have witnessed the removal of carcinoma when the case was taken early, and the patients have gone on and done very well with as perfect immunity as if they had never had cancer. This fact should encourage us in our watchfulness for these tumors, in order to make an early diagnosis of this condition which we are liable to see early in its history.

Dr. TRUMAN W. BROPHY: I had not the opportunity of examining the patient that Dr. Dennis has so kindly brought before the Society. I came in just as the patient was going away. This subject, however, is one that will always be of interest to the dentist because, as Dr. Black has said, these tumors are of such frequent occurrence within the oral cavity. The presence of carcinoma within the mouth is very apt to be overlooked by the average practitioner of dentistry. I had expected that the gentleman who preceded me would give the reasons why these tumors occur so

frequently within the mouth. The reason, gentlemen, why we have these growths developing so frequently within the mouth is that the membranes, the tissues generally of the oral cavity are most subject to irritation. The diseases of the teeth themselves, the breaking down of tooth structure, the ragged, broken sharp edges of the teeth that come in contact with the mucous membrane of the cheeks, of the lips, and of the tongue; the presence of irritants in the form of tobacco, are the exciting causes of carcinomatous growths within the mouth. We have not anywhere else in the human subject a part of the body so liable to be injured as the mouth.

It is possible that some of the gentlemen here may not know that the disease which terminated the life of General Grant was of dental origin. General Grant was a patient of Dr. Frank Abbott, of New York, and it was from Dr. Abbott's lips that I learned the story more fully and accurately than was ever published of that distinguished soldier's last sickness. He was a man who had no fear of pain, who had passed through many battles, and had been subjected to the injuries and hardships of campaigns. He paid no attention to the slight irritation at the base of the tongue, caused by a broken molar tooth. He continued to smoke; the tooth continued to irritate the parts, lacerating the surface, and by and by the tissue began to develop new cancer cells, and almost simultaneously with the development of new cells was a breaking down and a development of a characteristic epithelial growth. The diseased process began to extend down into the pharynx, involved the lymphatic glands, and when it reached a point that made it almost impossible for him to tolerate the pain he applied for relief, but it was too late.

The previous speaker stated that these growths are benign at their inception, or words to that effect, and had this case been properly treated, I have no doubt that the great soldier would have lived many years longer than he did.

Another case of a distinguished man that attracted the attention of not only the medical, but I may say the reading world, was that of the Crown Prince of Germany, afterward, for a brief period of one month, the Emperor of Germany. Had Frederick received the attention from a dental standpoint that he required he might be living to-day and be Emperor of Germany. But he neglected to give the attention which was his duty to give to the dental

organs. In his case there was a breaking down of the teeth, the formation of pericementitis and alveolar abscess and irritation, followed by fistulous openings, the development of a growth upon the surface of the membrane almost precisely like that of General Grant's, and which terminated his life. These cases impress upon us the importance of extreme care from a hygienic and dental standpoint in the way of dental manipulations, in the care of the teeth and of the mouth. These tumors of the oral cavity are constantly before us. Those of us who do something in this particular line of work perhaps come more frequently in contact with them than many who do not do this work; and yet I am satisfied that every practitioner of dentistry sometimes sees three or four cases within a month without making any special note of them, and neither the dentist or medical attendant recognizes them. They fail to recognize the disease until it becomes a source of discomfort, and then the patient applies for treatment.

A number of years ago it was my pleasure to listen to a series of lectures by a surgeon who stood high in the medical world, a man whose reputation perhaps was not excelled by that of any other man in the West. I refer to the late Professor Moses Gunn, Professor of Surgery for many years in Rush Medical College. His professional life largely antedated the beginning of a knowledge of bacteriology, or the study of germs and their influence in the establishment of disease. Professor Gunn once made the statement that carcinoma was a disease which would terminate the life of a patient at the end of four years after its development almost invariably, provided the pathological process was allowed to take its natural course. He even went so far as to make the statement that if he were to diagnosticate a growth which he presumed to be cancerous, in the event of the patient living four years without any surgical attention, he would be willing to admit that he had made an erroneous diagnosis. Views upon this subject have changed somewhat in recent years, and we are satisfied now that early operations for the removal of carcinoma are the only safeguards to the preservation of life.

Dr. H. A. CROSS: Possibly Dr. Brophy's closing remarks may have answered the question. But the thought occurs to me, is it possible to treat carcinoma in its early stages in any other way successfully except by surgery? Will medicinal treatment cure the disease if instituted sufficiently early?

Dr. BLACK: No sir. Possibly some cases of cancer have been cured by applications, simply by burning the mouth with arsenic, but it is a dangerous procedure for the patient. The knife is the only available remedy.

Dr. BROPHY: I concur with Dr. Black in that statement.

Dr. CROSS: I would like to hear Dr. Brophy say something further on this subject, if he will do so.

Dr. BROPHY: I have nothing more to say except this, that so much has been said and done in the way of suggestions about the treatment of such conditions by the use of medicinal remedies, that I am glad Dr. Cross has brought the question up, for I would like to place myself on record as saying that the treatment of carcinoma with plasters composed of arsenic, chloride of zinc, and various other substances is not to be commended. It is not only dangerous, but it is very trying to the patient. I think it does more to reduce the vitality of the patient than a surgical operation of immediately and promptly removing the disease by the knife. I would not advise one to operate too soon or to reach conclusions without careful study of each case, but so much harm is done in the way of deception on part of certain people who claim to be able to cure these conditions by the use of drugs, and naturally we ought all of us to hesitate to undergo a surgical operation if it can be avoided and resort to medication. But still I want to be very emphatic in stating that the remedies employed for the removal of these growths are most objectionable as a rule. Possibly cancer might be removed sometimes with the actual cautery. I think the actual cautery would destroy all of the diseased tissue in the beginning, provided it is not very extensive. A small patch upon the mucous surface, at the inception of the growth, might be eradicated by the use of the cautery, still I would prefer to enucleate it with the knife, removing all of the tissue involved in the pathological process. Whenever a patient is inclined to accept statements made by his friends and others, advising him to have certain things done with medicines, and not undergo a surgical operation, we almost always find that there is a complication even worse than that which previously existed, and in order to have the parts restored to health an operation must be performed. Too frequently patients place reliance upon medication and allow the condition to go on until surgical interference is of no avail.

Dr. DENNIS (closing the discussion): The point was brought out by Dr. Black as to the removal of a portion of the lower jaw, and I will say that the reason in this case a portion of the lower jaw was not removed was because of the high mortality attending the operation. The mortality in cases where the jaw has been removed is about $25\frac{1}{2}$ per cent, while the mortality in cases where the jaw is left is only $5\frac{1}{2}$ per cent.

In regard to the question of Dr. Cross relative to the use of plasters of various kinds, I would say that this patient did that very thing; that after being advised of the necessity of an operation as early as possible, when the growth was quite small, he demurred, and left the physicians in charge and sought advice elsewhere. He used various remedies that were suggested from time to time, with the result that the growth only increased in size. You could judge of the size of the growth partially from the swelling of the face, and also of the secondary processes in the glands beneath the chin. Medicinal preparations had absolutely no effect, and undoubtedly aggravated the condition, because the carcinoma increased more rapidly.

Dr. Black spoke of the breaking down of epithelial tissue and of the cancer cells by a metastatic process being carried into distant parts of the body. These cancer cells are very frequently carried in that way; ulcerated processes break down the tissue; the cells become separated from the cell nests, and are carried by means of the lymph channels to the lymph glands in the immediate vicinity, and from them to other lymph glands in other parts of the body. If a vessel be torn or broken into the cells may be carried by the blood vessels to other parts of the body.

The patient whose case I have reported to-night fully understands the probability of recurrence of the growth, and has taken this one chance for his life, so that if he does live for a few years, it will be due to the operation.

INCIDENTS OF OFFICE PRACTICE.

Dr. H. A. CROSS: I wish to make a brief report of the case I referred to at the last meeting of antral disease. I was in doubt as to whether I could insert a longer tube in the antrum. However I decided to do so, and the result has been very satisfactory. The patient is getting along nicely.

NORTHERN ILLINOIS DENTAL SOCIETY.

Tenth annual meeting at Rockford, October 20, 21, 1897.

The society convened Wednesday, October 20, at 11 A. M.

During the meeting about fifty members were in attendance, and the following were elected to membership:

J. J. Reed, Rockford; F. S. Tricky, Freeport; C. N. Hogland, Elgin; W. T. Tucker, Lena; F. A. Wild, Belvidere; R. L. Hopkins, Sterling; A. J. Elmer, Rochelle, and C. L. Snyder, Freeport.

The total membership of the society is ninety.

A number of committees made their reports.

On motion of Dr. M. R. Harned, of Rockford, the President appointed Drs. Louis Ottofy and W. H. Taggart, of Chicago, and M. L. Hanaford, of Rockford, as a committee to draft a petition to be sent to the National Dental Association and to the National Association of Dental Examiners, expressive of the sentiment of this society regarding the modification of the dental laws in the various States of the Union.

The President, Dr. E. H. Allen, of Freeport, read the annual address, which was discussed by Drs. Hanaford, Harned, (M. R.), Gill (H. C.), Dillon, Cormany, Perry, Ottofy, Taggart and others. The discussion was closed by the President and the subject passed.

At the afternoon session Dr. E. J. Perry, of Chicago, read a paper entitled, "Possibilities of Prosthetic Dentistry," which was discussed by Drs. Taggart, Chappell, Dorn, Helm, Cormany, Gill, (F. C.), Allen, Harned (M. R.), Hanaford, Ottofy, Underwood, Lombard, Phillips, and closed by the essayist.

Dr. Chas. J. Sowle, of Rockford, then read a paper of Dr. M. A. Webb, of Chicago, entitled, "Shaping and Improving the Appearance of Natural Teeth by the Wheel." The paper was discussed by Drs. Lombard, Perry, Dorn, Rimes, Harned (M. R.), and Sowle, and closed by the essayist.

Dr. C. L. Snyder, of Freeport, then read a paper entitled, "Erosion as found in the Orient—Cause and Effect." The paper was discussed by Drs. Ottofy, Cormany, Gill (H. C.), Underwood, Phillips, Helm, Chappell, Beckwith, Elmer (A. J.), and closed by the essayist.

At the evening session Dr. C. W. Cox, of Batavia, read a paper entitled, "The Artistic and Mechanical in Dentistry." It was discussed by Drs. Perry, Taggart, Rimes, Brophy, Cormany, Allen, Ames, Hanaford, and closed by Dr. Cox.

A paper entitled, "The Law of Similars Applied to Dentistry," was then read by Dr. M. R. Harned, of Rockford. It was discussed by Drs. Cox and Allen and passed.

After the regular program the profession of Rockford provided a musical and literary entertainment, and some hypnotic experiments were performed by Prof. Chas. B. Lyman.

On Thursday, October 21, the following clinics were performed:

1. Operation for closure of a cleft palate for a patient thirteen years of age, by Dr. T. W. Brophy, of Chicago. By the courtesy of the Rockford City Hospital authorities, the operating room of the hospital was placed at the disposal of the society. The operation of closing the cleft was successfully performed by Dr. Brophy. In addition to the cleft there has been a harelip operation performed some time ago, with imperfect result, however, and the opening left by the previous operation was closed by Dr. Brophy by a plastic operation.

2. Exhibit of pyorrhœa alveolaris cases, Dr. J. W. Palmer, of Rockford.

3. Tin and gold cylinder filling, Dr. T. W. Beckwith, Sterling.

4. Treatment and filling of erosions, Dr. C. L. Snyder, Freeport.

5. Setting crowns and bridges with gutta-percha, Dr. W. H. Taggart, Chicago.

6. Platinum and gold effect in inlays, and precipitated gold and oxyphosphate filling, Dr. W. V. B. Ames, Chicago.

7. Gutta-percha filling, demonstrating immediate separation by use of Perry separators, Dr. Grant Goodrich, Elgin.

8. Removal of pulp by cataphoresis, Dr. E. H. Allen, Freeport.

9. Cataphoresis and immediate root filling, Dr. Chas. J. Sowle, Rockford.

10. Gold filling, using Watts' crystal gold, Dr. J. J. Reed, Rockford.

At the afternoon session was a description by Dr. Brophy, of his clinic performed at the hospital in the morning.

After the transaction of miscellaneous business, Rockford was selected as the next place of meeting.

The following officers were elected: Dr. C. B. Helm, President, Rockford; Dr. Louis Ottofy, Vice President, Chicago; Dr.

James W. Cormany, Secretary, Mt. Carroll; Dr. M. R. Harned, Treasurer, Rockford.

Executive Committee: Dr. C. W. Cox, Batavia; Dr. O. A. Chappell, Elgin; Dr. E. J. Perry, Chicago. Local committee: Dr. Chas. J. Sowle, Rockford; Dr. A. M. Harrison, Rockford; Dr. J. L. Palmer, Rockford.

The society then adjourned.

ANTRAL DISEASE.

Your request of not very recent date duly received and I will report a case of diseased antrum which is of course nothing new or uncommon, but this particular case may prove of interest.

Notwithstanding the fact that the American dentist during the last quarter of a century or more has been trying to educate the American people in regard to the value of good teeth, the necessity of prompt attention when any defect is discovered and how to care for them, we are often painfully made aware of the fact that our efforts in this direction have been only partly successful. I had a very good demonstration of the results of neglect not long since when Mr. B—, a man of German birth came to my office to see if I could find and remove the cause of a large lump on his face which was located on the right side of his nose, about on a level with the floor of the antrum. I asked him how long the swelling had been there, he answered about one year. When asked if it had been painful, he replied that it had been somewhat painful at times. I also learned that pus or a discharge often came from the right side of the nostril. After learning the above, I examined his mouth and found the crown of the first right superior bicuspid, and the first, second and third molars gone, the root only remaining. Mr. B— stated that a few years back he was troubled severely with toothache. I found the parts surrounding the roots would give, if pressed with a blunt instrument, and that the surrounding parts would bulge and that the one tooth left on that side, which was perfectly sound, could be moved from side to side or could be pushed up, taking the gum with it, same as when I used the blunt instrument, the bone tissue seemed to be gone. After examining the parts, I removed the roots, but as they did not give an outlet for the pus, I decided to remove the sound bicuspid, which brought with it a piece of process the size of a small hickorynut, the pus having eaten away the bone tissue until this portion was entirely isolated from the surrounding bone. As soon as the tooth was extracted, a large quantity of greenish watery substance oozed out. After cleansing the cavity, I cut out the remaining diseased portions of bone, after which I dressed with iodoform gauze, which I changed every few days for three weeks, of course using a disinfectant each time. At the end of this time, as the parts looked healthy, I allowed it to heal and the only bad result is that it will spoil Mr. B—'s mouth for an artificial denture. The great wonder to me is how nature can so protect from harm

W. HUMPHREY, D. D. S.

CARROLL, IOWA.

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LOOKING FOR TROUBLE.

Probably one of the most frequent causes of the continuance of diseased conditions is due to the neglect of dentists in making careful diagnoses of diseases present in the mouths of their patients. As a rule the patient is conscious of some source of pain or irritation, which leads him to place himself in the care of the dentist. The dentist corrects the evil, looks for some more cavities, removes a little salivary calculus, and dismisses the patient. He generally fails to study the mouth, with a view to making either esthetic or practical improvements. In other words he fails to be looking for trouble. A case in point may be cited at this time. The patient has been in the hands of a good, conscientious, honest and able operator for years, who always "cleaned and filled his teeth." A careful examination at once revealed the fact that one side of the mouth had not been used for mastication for years. There was no complaint as to any particular tooth on that side, on the contrary the patient said the dentist told him everything was "all right." The losses on both sides were equal and no reason seemed to exist why one should be used in preference to the other. Careful tapping and tests of heat and cold seemed to indicate nothing wrong, but the patient did remember that the insertion of a large amalgam filling in the upper first molar on that side was followed by considerable pain, but that it had been "all right now for years."

It seemed best to tap the tooth; the pulp was dead, the root canals, while not necessarily filled with offensive matter, contained material in a stage of decomposition. The slight soreness led to the abandonment of this side of the mouth, which was

abetted by the difficult eruption of a third lower molar, whose environment was constantly in an inflamed condition. Having found, in addition to calculus, caries and blind abscess, also *eruptio difficilis*, a search for further discoveries was instituted, and this was rewarded by finding abrasion, two teeth sensitive from erosion near the gingival margin and one tooth attacked by *pyorrhœa alveolaris*. The latter was confined to about one-half of the circumference of the root of a lateral incisor, and its form was of that apparently inoffensive yet destructive nature, which would have resulted in the loss of the tooth, ere the patient could have been aware of the seriousness of the condition.

These diseases were all corrected and the patient instructed to learn the use of the disabled side; at the end of six months (except for the abrasion which is the result of using one side only for years) both sides of each arch are in an equally healthy and useful condition. We suggest to the busy dentist to take time to look for trouble, and the dentist who is not so busy can find no more useful and advantageous employment than to study the conditions which he will find if searched for, and which he must learn to recognize while looking for trouble. Both classes of operators will be more useful to the community.

REVIEWS AND ABSTRACTS.

TIN FOIL AND ITS COMBINATIONS, FOR FILLING TEETH. By H. L. AMBLER, M. S., D. D. S., M. D., Professor of Operative Dentistry and Dental Hygiene, in the Dental Department of Western University, etc. Philadelphia: The S. S. White Dental Mfg. Co. London: Claudius Ash & Sons, Limited, 1897. Price, \$1.00.

This 12 mo. flexible covered book of 100 pages is a timely plea for the more extensive use of tin alone or in combination, which coming from the pen of an operator whose familiarity with the subject during a period of thirty years, entitles it to a careful consideration. It recites the history of the use of tin from the earliest period, and at length describes its introduction into and its use by the dental profession from the beginning to the present time. The question of the value of tin as a tooth saving material is ably presented and that it should stand next to gold is beyond dispute.

It is impossible to take issue with the principles enunciated by the author, and since the above is the *raison d'être*, it accords with the views of the reviewer. We take exception to the suggestion to use Tg as a symbol of tin gold. Tg is meaningless to the scientific world, while AuSt clearly signifies all that is necessary the world over, and although much importance may be attached to the value of tin, it ought not to outrank the king of metals in the order of classification, hence "Goldtin" is much better than "Tingold."

We cordially commend the book to the attention of the progressive practitioner, who will soon find many opportunities to use tin in simple cavities, which practice by its experience will soon convince him that even a complicated large tin filling can be put in almost as easily and quickly as an amalgam filling, and which is so much more serviceable.

OTTOFY.

DOMESTIC CORRESPONDENCE.

OXYCHLORIDE OF ZINC.

FREMONT, NEB., October 25, 1897.

EDITOR DENTAL REVIEW.

Dear Sir :—While I do not in the least object to criticism being made on my paper entitled, Oxychloride of Zinc, such as those from the pen of Dr. MaWhinney, published in the October REVIEW, I think the claims for the material he credits me with making are stated somewhat stronger than a careful reading of the paper would justify.

The paper was prepared and read before our State Society, not for the purpose of "reviving old notions" and "theories exploded long ago," but to add spice to our meeting and provoke discussion, as well as to remind our members that possibly they were neglecting an article that in some cases can be used to advantage.

Because I sometimes use oxychloride of zinc, I do not claim it to be the only root canal filling, neither do I wish to go on record as advocating the mummification of pulps if I occasionally use a material that I hope and believe will, for a long time, take care of any minute portion of animal tissue that I have freely admitted I have my doubts about having been able to recover from

the roots of some teeth. For the filling of such a canal as the doctor describes—so simple that a novice should be able to fill—my method is much the same as the one he recommends. The only difference being that I do not attempt any more to pump chloro-percha into a root, but, after selecting my point, fit into canal and add a little chloroform, then with a slight up and down motion make my chloro-percha *in situ*, give a blast of hot air and send home with a cold instrument. This method I think lessens the danger of air bubbles, but is of course a question of personal equation and results only count.

One thing that makes me think Dr. MaWhinney put in some of his rather vigorous statements to make an argument is that I find him using in a canal one of the agents that he claims to be a better mummifier than chloride of zinc. This he tells us immediately after having severely scored me for using an escharotic and mummifier. If he thinks it necessary to incorporate a little formalin with the filling that is to occupy a canal that has been “rendered aseptic and cleaned—mechanically and chemically—thoroughly dried by the use of antiseptic oil, antiseptic cotton, alcohol, hot air, hot root canal drier, and lubricated with hot eucalyptol.” Why criticise me for trying to impregnate the tubuli and fine canals of a tooth that I am sure I have not been able to cleanse with a little of the chloride of zinc? I do not claim that the oxide will go further than it is put mechanically, but that the chloride will leave the oxide, and get there any one who has had a live tooth filled with oxychloride of zinc will testify.

I frequently find upper molars where I am unable to satisfactorily cleanse all the canals. To fill those I can properly prepare with gutta-percha, and then work thin oxychloride of zinc into the pulp chamber and as far into the other canal as I have been able to broach, dismiss the patient hoping the tooth will not trouble.

There are canals and canals; some are filled with “Gramm's fine copper points,” some a little smaller are not filled at all. I know the stock expression is that a canal too small to broach is too small to create a disturbance. But is that true? Unless a canal is entirely obliterated before the death of the pulp, it will contain plenty of dead matter to in some cases, cause all the trouble the patient and operator can care for. It is in the pulp chamber of

such a tooth that I would use oxychloride of zinc, and I hardly think its use can be justly accounted as unscientific.

H. T. KING.

ST. LOUIS LETTER.

ST. LOUIS, November 3, 1897.

EDITOR DENTAL REVIEW.

Dear Sir :—The St. Louis Dental Society held its regular monthly meeting on Tuesday evening, November 2, at the office of Dr. Wm. Conrad, where all present were royally entertained. The house was filled to overflowing, many out-of-town members and visitors being present. Dr. Achelpohl, of St. Charles, and Dr. Mc-Millen, of Alton, favored us with their presence and kind words. Dr. Condit, of Findley, Ohio, was present and exhibited the combination plate and bridge. His samples were examined with a good deal of interest. His system seems to have many good points.

Dr. Bartlett, president of our State board, gave us an outline of the work done since organizing, which was very interesting. In addition to the incompetents dumped on this State by those surrounding us the diploma mills of our own State have added to the number until now there are about 500 illegal practitioners for the board to contend with. We will probably have a decision from the supreme court on the validity of our law at no distant date. If it stands the test Missouri will have the best dental law in the United States, which will be enforced by a board of as honorable men as our profession boasts. Then incompetents can migrate to a healthier clime and Missouri will head the list for clean dentistry. The society will soon complete its program for '98, which will be the strongest in many years. They will meet in one of the finest halls in the city, centrally located, so that the constantly increasing membership and numerous visitors may be accommodated properly and where trains may be reached easily after adjournment. All are in training for the State meeting to be held next summer at our beautiful suburb summer resort, Merimas Highlands, when we expect to have the finest meeting and best time seen in the Mississippi valley in many moons. Your friends are coming so you may as well join them.

Yours truly,

ST. LOUIS.

PRACTICAL NOTES.

EVIL EFFECTS OF MERCURY.

BY R. W. STARR, D. D. S., CHICAGO, ILL.

For the past four years I have been endeavoring to persuade my friends in the dental profession to break away from narrow prejudice, and to investigate for themselves by due process of observation and experiment whether mercurial preparations in the mouth were not in many instances very injurious to the individual having them. The results of my efforts in that direction are not as satisfactory as I could wish; though in some cases enough interest has been awakened to, in a measure, compensate me for my labor.

Dentists are but human beings, and as such are liable to make many grievous errors, and frequently content to follow out a certain line of thought and action, simply because they were taught at college that such things were true and right.

How many of the theories and ideas of fifty years ago are looked upon by the enlightened people of to-day, as being so utterly ridiculous, that it seems impossible that any one should have ever tolerated them.

Are we of to-day any the less liable to err than our forefathers? I think not; therefore whenever a question arises it is much better to investigate the subject thoroughly and find out what is true for ourselves, than to deride and wrap ourselves in a mantle of conceit and self-congratulation.

That a great many persons are to-day suffering from the effects of mercurial preparations in the mouth, in the forms of amalgams and red rubber plates, I am firmly convinced, six years of constant study and research in this direction having demonstrated to my satisfaction that such is the case.

There is no truer statement than that we are not at all times equally susceptible to the same things, a substance which may to-day prove nourishing, may at some future time prove not only distasteful but absolutely injurious and even poisonous; all of which is due not to a change in the character of the substance, but to some developed idiosyncrasy of the individual.

The same is true of mercury. We may have it in the mouth for years without experiencing any bad effect, and later may de-

velop a mercurial diathesis of which we are unaware, the result being we are under the influence of this most lasting drug, while we are in total ignorance of the fact.

I can hear the skeptical say, why this is impossible, there is not enough mercury in an amalgam filling to do any harm, and as for red rubber plates, never by any means has free mercury been obtained from it.

In answer I would say, it is not the quantity but the ever presence that does the damage. With every mouthful of food, either liquid or solid, carried into the stomach minute particles of mercury goes down with it.

One peculiarity of its action is that any one suffering from a chronic ailment is much more susceptible to it than when they were not under chronic influence.

The effect upon the nervous system is marked and nearly always predominates.

I maintain that over one-half of those afflicted with what is commonly called facial neuralgia, can be greatly relieved by simply removing the mercurial preparation, and generally cured by antidoting the drug effect.

In throat troubles it is especially active. One case in mind: young lady, æt. twenty, elocutionist, was repeatedly attacked by tonsillitis. When these came on, which were generally quite sudden, would lose her voice.

This condition lasting several days, making it impossible for her to keep her business engagements; had treated for it for three years, but beyond palliation could not make any advance.

She was finally sent to me by her physician, who had begun to be suspicious of her amalgam fillings. I removed twenty of these and replaced with oxyphosphate, later with gold. From the time the amalgam was removed, February 1, till the cavities had been refilled with gold, May 1, she had one attack; since then, two and one-half years, she has had no recurrence of the trouble. After I had removed her fillings her physician put her on medicine to antidote the mercury.

Another case: Mrs. B., æt. twenty-seven, had a vascular tumor on the gum, between the left central and lateral incisor about the size and shape of a large chestnut, which had been growing for eighteen months; she had it cut away and cauterized several times, but it always returned with renewed energy.

Her dentist had in despair recommended the extraction of the incisor teeth and cutting away of the alveolar process, as the only possible cure; this would necessitate the taking of an anæsthetic, which she would not consent to do, as she was then pregnant.

The tumor bled constantly and the hemorrhage was worse at night than in the day, amounting to about two ounces of blood in twenty-four hours.

Her physician who was an old friend of mine, sent her to me to ask my opinion as to the necessity of an operation: after a thorough examination and history of the case, recommended that the operation be postponed until last resort; removed eight amalgam fillings and antitoxed the mercury, then a few days later cut away the tumor and cauterized thoroughly; at the expiration of two months all traces of the tumor had disappeared.

These are but two of many similar cases which I have had and cured of a reputed incurable disease: not that my medicine or treatment was any better or more thorough than others, but because I had eliminated a condition which was antagonizing all other drug effects, as mercury once it obtains foothold in the system will generally neutralize all other weaker drugs which may be administered. Any one who has had a patient who has been salivated, or taken much mercury in its many forms, will I think bear me out in this statement.

As to red rubber plates: if it is not the coloring matter but the nonconductivity of the rubber as some claim, which is injurious, why is it that such mouths will frequently give no trouble if black rubber is substituted; this has been done successfully many times.

I could cite many other cases but space will not permit.

For the benefit of those who wish to investigate this subject, I will state a few of the leading symptoms of mercurial effects: facial neuralgia, feeling of great lassitude, aching of the limbs, choking as if a lump in the throat, extreme sensitiveness to cold, desire to be warmer even when in perspiration, oppression as if a weight upon the chest, palpitation of heart upon a slight exertion, and profuse flow of saliva. Of these symptoms it is quite common to find five or six present in one case: though of course one can hardly expect to find them all at one time, still I have had several

cases which did have all. Now I would like to ask what logical deductions are to be drawn from such experience?

If one has had such good results why cannot others? If I have succeeded in awakening in some of my readers a desire to investigate this subject thoroughly, I shall feel that I have been amply repaid.

Perhaps you will ask what I would suggest as a material for filling such cavities as are generally filled with amalgam; I would recommend gutta-percha, cement or tin where gold cannot be used, but at any rate use anything in preference to a material which contains mercury.

To those who are skeptical, who see more profit in derision than investigation, I would say that "none are so blind as those who will not see."

FARINA, ILL., October 7, 1897.

TO THE EDITOR OF THE DENTAL REVIEW.

Dear Sir:—I send you a few practical notes which I trust may be of interest to the readers of the DENTAL REVIEW.

Yours truly, C. H. WEST.

* * *

Financial considerations sometimes necessitate something cheaper than entire gold fillings, where ordinarily I would place gold. By observation I have noticed that the weak point in a gold filling is at the cervical margin, and that the weak point in an amalgam filling is at the coronal, or proximal margin; hence for some time past, I have been using the following method to some extent: Prepare the cavity with as much care as for a gold filling; fill the cavity half or two-thirds full of a good amalgam as dry as it will work well, using as little mercury as possible and immediately add Watts' crystal gold, which amalgamates with and becomes a part of the amalgam filling. After all the mercury is taken up, any kind of cohesive gold can be used to finish the filling. In this way a large cavity in the posterior teeth can be filled at a less expense than to use an entire gold filling and at the same time overcome the weak points and get the best results from each kind of filling.

* * *

For some years I have been giving as a nervine a thirty to thirty-five drop dose of extract of scullcap with good results.

The prescribed dose is from thirty to sixty drops, but I never have needed to use more than the above. It is as far as I know perfectly harmless, with no ill after-effect. Patients that seemed to have no control over their nerves have submitted to long and tedious operations with the use of this nervine, remarking that they felt so easy that they could almost go to sleep.

*

*

I use the Hayes vulcanizer, on which the cover with packing is placed firmly on the boiler and the flange ring with set screw in it is turned to that, and set screws tightened.

My practice is to first oil the packing, then place the cap or cover so that a mark made on the outer edge of it corresponds with a similar mark on the boiler, thus the packing always rests in the same place on the boiler. I then turn the flange ring so that one of the three set screws is just in line with the safety valve and thermometer, and tighten the set screws, thus always having the pressure in the same place. In this way I have used a single packing for more than seven years without leaking.

SETTING BRIDGES.

INDIANAPOLIS, IND., October 13, 1897.

TO THE EDITOR OF THE DENTAL REVIEW.

Dear Sir:—The following scheme, original with me so far as I know, may stand the test of time. I have had occasion several times to remove bridges (not my own of course) and have always been forcibly reminded of the "dead past" or anything dead, or something of that nature. This state of affairs can be avoided to a certain extent by proceeding in the manner that I have in setting bridges recently. I apply the dam where practicable and coat the pier teeth or roots with nitrate of silver. This may be done by direct application or by cataphoresis. There are three points of advantage in this method.

1st. If the tooth is a live tooth the sensitive condition is obviated, especially if the cement is slightly acid in reaction.

2d. An oxyphosphate cement will adhere to this surface more surely than to the tooth.

3d. In case any cement washes away at any time, or in case a band does not cover the root entirely the nitrate of silver coating protects it thoroughly.

I might add a fourth reason, and that is that the tooth would be in an aseptic condition and would have a tendency to render the cement so, but that is conjecture as I have never removed a bridge that has been set under these conditions.

Yours truly,

ALEX. JAMESON.

MEMORANDA.

What do you cap pulps with ?

Do you "arthurize" teeth any more ?

We like a salt water solution of cocaine hydrochlorate.

Dr. E. H. Angle, of St. Louis, was in the city recently.

Dr. W. P. Horton, of Cleveland, was in Chicago in October.

The French National Dental Congress met in Paris, October 28 to 30, last.

How, and with what can you mummify a dead pulp and leave it in the root ?

It is now the *Dental Brief*, L. D. Caulk, publisher, Camden and Philadelphia.

At the late Horse Show in Chicago, some of Dr. T. W. Brophy's horses took prizes.

The Australian Journal of Dentistry is a new publication, the first one in that continent.

Dr. D. M. Clapp, of Boston, will do the X Ray work for dentists who desire to locate missing teeth.

The Odontographic Society proposes to hold an extensive clinic and banquet some time in December.

Rockford, Ill., is a nice, pleasant place for a meeting, it has a good hotel and splendid meeting facilities.

Dr. H. H. Keith, of St. Louis, Mo., who has been sick since September, has recovered sufficiently to be removed to Asheville, N. C.

The Chicago Dental Society will meet hereafter in the Stewart Building, State and Washington Sts. first Tuesdays in each month.

Madame Bertheaux, of Soisson, France, died recently at the age of seventy-four. She had been practicing dentistry in France for forty-five years.

R. C. Waller Bey, of Cairo, Egypt, since 1861 the dental surgeon to the successive Khedives and their families, is deceased at the age of fifty-eight.

Acetanilid will dissolve in water 5 grains to about eight ounces at 70° F. This is not a true solution as on evaporation the crystals will cling to the sides of the beaker.

In making some recent tests of solubilities in water we find that hydronaphthol will not dissolve in water in greater proportion than 5 grains in twenty-eight ounces, the water being kept at a temperature of 70° F. This was agitated frequently.

SIXTH DISTRICT DENTAL SOCIETY, OF THE STATE OF NEW YORK OFFICERS FOR 1897-98

President, George H. Smith, Cortland; Vice President, Arthur S. Barnes, Oneonta; Secretary, Frederic W. McCall, 36 Henry, St., Binghamton. Treasurer, Edwin D. Downs, Owego.

OHIO STATE DENTAL SOCIETY.

The next annual meeting of the Ohio State Dental Society will be held at Neil House, Columbus, Ohio, December 7, 8, 9. One day will be devoted to clinics.

J. R. CALLAHAN,

Chairman Executive Committee.

NORTHERN ILLINOIS DENTAL SOCIETY.

The following were elected at the meeting held October 20 and 21, at Rockford: President, C. B. Helm, Rockford; Vice President, Louis Ottofy, Chicago. Secretary, J. W. Cormany, Mt. Carroll; Treasurer, M. R. Harned, Rockford. Member Executive Committee, E. J. Perry, Chicago. The next meeting will be held at Rockford on the third Tuesday in October, 1898.

The live pulp left in the tooth which is covered with the cap still gives trouble. Dr. Ludlow has no trouble, but his lower central is not a fine test of such practice. When the cap extends beneath the gingival margin between the bicuspid and molars is the place where most trouble is located. We do not hesitate to place a cap on a living tooth at times, but as a general practice we think it is not best.

In the use of formalin for preserving a dead pulp, we have found it useless for a long time, i. e., it will preserve it for forty or fifty days. When one-half of the pulp has been removed the remainder will rest quietly for about three months, then it will begin to lose its potency. Formalin is soluble in water and we explain its nonpreservative properties to that fact. We think you will do well to remove the pulp from the roots as formerly and not depend on mummifying it.

ROCKFORD ODONTOLOGICAL SOCIETY.

An auxiliary society of the Chicago Dental Society was organized in Rockford on the evening of October 20, at the time of the meeting of the Northern Illinois Dental Society, with the following charter members: M. L. Hanaford, M. R. Harned, J. E. Harned, G. A. Furman, Boyant Kerr, C. A. Kitchen, C. B. Helm, H. C. Gill, F. C. Gill, C. J. Sowle, A. M. Harrison, J. J. Reed, J. L. Palmer, B. F. Ells and E. S. Tebbetts. A temporary organization was effected by the election of Dr. M. L. Hanaford as chairman and C. B. Helm as secretary.

By combining eucaïn with cocain we secure a valuable anæsthetic with the advantages of both and none of the inconveniences of either, according to the *Journ. de Méd. de Paris*, of September 12. Eucaïn is the methyl ether of methyl-benzotetramethyl- γ -oxypiperidin-carbonic acid, and is a white crystal substance soluble in water, alcohol, ether, chloroform and benzene, melts at 104 degrees C. is not decomposed by boiling like cocaine. Its solutions are consequently not affected by sterilization. Its anæsthetic action is more durable than that of cocaine, while it is not toxic. Its effect on the pulse is to retard it, while cocaine

accelerates it. A good formula for the combination is: Hydrochlorate of eucaïne, hydrochlorate of cocaine, aa 20 centigrams; boiled distilled water, 20 grams. For hypodermic injection 1 c.c.

THE EIGHTH DISTRICT DENTAL SOCIETY, OF THE STATE OF NEW YORK—OFFICERS
FOR 1897-98.

President, S. Eschelmann, Buffalo; Vice President, Louis Meisburger, Buffalo; Recording Secretary, W. E. Marshall, Buffalo; Corresponding Secretary, D. F. Bentley, Niagara Falls; Treasurer, C. W. Stainton, Buffalo; Librarian, S. A. Freeman, Buffalo.

The regular meetings of the society will be held on the last Tuesday of September, October, November, December, January, February, March and April.

The joint committee elected at the union convention of the sixth, seventh and eighth districts, held at Buffalo the 26th and 27th ult., to arrange for next convention is as follows: 6th. J. B. Howe, Ithaca, Chairman, A. S. Barnes, Oneonta; 7th. J. W. Cowan, Geneseo, C. H. Nicholson, Rochester; 8th. L. Meisburger, Buffalo; B. V. Sherrar, Wellsville.

W. E. MARSHALL, *Secretary, 8th District.*

OBITUARY.

W. N. MORRISON—W. T. REED.

WHEREAS, in the providence of Almighty God, He has seen fit to remove from our midst, two of our most valued members, Dr. Wm. N. Morrison, of St. Louis, and Dr. W. T. Reed, of Macon, and

WHEREAS, the fine personal character, the high professional standing and the general individuality of each of these men, who have held the highest office in this society, makes their loss a personal one to every one of us, as well as to the profession at large. Therefore, be it

Resolved, that in the death of Dr. Morrison and Dr. Reed, this association has lost two valuable workers, each of us a friend, and the dental profession members whose high ideals and ability made them an honor to that profession.

Resolved, that the deepest and most heartfelt sympathy of this association is hereby extended to the bereaved families in their affliction, and

Resolved, that this expression of esteem and sympathy be placed in full upon the minutes of this society, and a copy be sent to their respective families and journals.

JOHN G. HARPER,	}	<i>Committee.</i>
EMMA EAMES HARPER,		
G. W. TAINTER, JR.,		

H. H. SULLIVAN, *Secretary.*

THE DENTAL REVIEW.

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CHICAGO, DECEMBER 15, 1897.

No. 12

ORIGINAL COMMUNICATIONS.

DENTAL ANALGESICS.*

BY N. S. HOFF, D. D. S., ANN ARBOR, MICH.

The subject of anæsthetics, local and general, pain relievers, such as anodyne remedies and soothing therapeutic agents of all kinds, have received in recent years more attention, and more effort has been expended to secure freedom from pain in dental treatments than ever before. This is no doubt largely due to the fact that constant advance in operative procedure has made it necessary that the comfort of the patient should be taken into account, as well as the mechanical and artistic procedure and results. History will, it is to be hoped, write down this as the period when comparative painless dentistry became an accomplished fact. Perhaps no one thing has contributed so much to this interest and activity as the discovery and the use of cocaine as a dental anæsthetic, and since to this drug and its class we are indebted for nearly all practical methods for producing comparative freedom from pain, it is my purpose to briefly call your attention to the more important applications of these remedies to dental practice, not that I have anything new to offer you in connection with them or their therapeutic application, but for the purpose of crystallizing somewhat our experience with these agents. I wish to say at the outset that I do not wish to think of these drugs or the various methods for using them as anæsthetics, as they are generally termed and spoken of. I think there is a great deal in associations, and as we have long applied the term anæsthetic to drugs which produce insensibility, generally, if not always, because of the manner of their actions they produce unconsciousness, and

*Read before Minnesota State Dental Association, Sept. 8, 1897

since we cannot use cocaine and its kind to produce general effects without jeopardizing life, and since when they are used to produce so-called local anæsthesia we seldom obtain complete local insensibility but comparative modification of physiological function, it seems to me that the term analgesics is a more fitting one, although it has usually been applied to remedies which have power to relieve the pain incident to pathological conditions. If you will allow me to define my definition of analgesics, I would say that they are remedies capable of subduing or preventing excesses of pain under conditions which ordinarily produce them.

I do not want you to think I am making any apology for the shortcomings of the agents I want to bring to your attention, or to belittle their powers in any way. But I think it will save us much disappointment and enable us to more confidently secure their best values if we rather under than overrate their powers. My experience with various dental pain relievers and obtundents leads me to make the statement, that we do not possess any remedy or method that is capable of producing local insensibility without possible and even probable undesirable systemic accompaniments.

If the mere statement of this idea is not convincing I am sure it will only need a short and limited experience to prove it to the most skeptical. Many earnest and conscientious practitioners have discarded cocaine and cataphoresis because disagreeable secondary or by-effects have been so common as to cause them to return to general anæsthetics or operative procedures, which while they will not insure positive results, they so mitigate the incidental pain as to render the operation tolerable. It would be a great gain no doubt in securing more perfect manipulation if it could be done without inflicting pain to the patient. It is my confident belief that the full benefits of cocaine and eucaïne have not been obtained by any considerable number of the profession because of lack of persistence in their use and a constant endeavor to master and overcome their pernicious tendencies. Many enthusiasts were born about the time cataphoresis came into prominence and already this valuable method is being deserted because it will not accomplish the whole thing when the button is touched. The hypodermic use of cocaine experienced the same kind of treatment, but both the drug and the method are capable when intelligently handled of great usefulness. It is because of this condition of affairs that I have the courage to bring this subject to your no-

tice, as I feel deeply my inability to add anything new to methods or principles, but I hope for a thorough discussion of it at your hands and that this may be instrumental in stimulating our faltering courage to the end that we shall make ourselves masters of the art of subduing the necessary pain incident to our operations, thereby enhancing their value. If we cannot accomplish this with our present drugs and methods, perhaps we shall with such as shall result from the knowledge we shall gain by a larger experience and continued agitation.

There are but two agents at the present time which in any considerable measure command our confidence as dental analgesics, and they are cocaine and eucaïne. It is true there are other agents and many methods of procedure which are available in special cases and serve excellent purposes; but they are not of sufficient universal application to entitle them to special consideration, and particularly since they have been so long used that their virtues are well known to every one. For instance, heat, cold and electricity are often commended for certain cases or conditions, but these peculiar circumstances are so seldom met that their use in ordinary and regular practice hinders rather than helps methodical operative procedures to such an extent as to impair their value, and we find operators who, while not wholly ignoring the comfort of their patients so far as making use of any medicinal agents or procedures to overcome pain, resort to or rather depend upon skillful manipulation with well-formed and sharp instruments to secure rapidity and comparative freedom from pain, at least to the extent of toleration. Much can be and should be said for this method, but it is not enough. In many cases entire freedom from pain is positively demanded, and it is cruel if not barbarous to inflict pain under these circumstances when it could be avoided by a judicious use of means within command of any ambitious and intelligent practitioner.

The general pharmacology and therapeutic action of cocaine and eucaïne are so nearly alike and familiar that I shall not burden you with a detail of them here, and yet in order to make the point that I am anxious to bring out it will be necessary for me to refer to their predominating characteristics when used as dental remedies. They are both soluble in water and can be administered hypodermically, so as to induce local insensibility. Cocaine when injected parenchymatously into the gums, for instance acts first

directly on the sensitive nerve ending and secondly by stimulating the vaso-motor nervous system local anæmia is induced. Eucaïne used in the same way produces a similar sedative action on the sensitive nerve endings, but it also paralyzes the vaso motor nerve system and induces hyperæmia and the tendency is to congestion rather than depletion as with cocaine.

It has been found that larger doses of eucaïne and in stronger concentration may be used without producing systemic disturbances than of cocaine, consequently we can expect more profound analgesia from safe doses of eucaïne than from cocaine, although more profound results will come from an equal dose of cocaine than from eucaïne. The hypodermic dose of cocaine for work about the face and mouth is $\frac{1}{8}$ to $\frac{1}{2}$ grain, and for safety in not over 1 per cent solution. A corresponding dose of eucaïne would be $\frac{1}{4}$ to $\frac{3}{4}$ grains, but it can and should be used in more concentrated solution to get satisfactory results. Some recommend 10 per cent solutions, but I find 5 per cent sufficiently ample for any purpose.

This relation of dosage I have taken from the research of Prof. Charteris, of Paris, who made an exhaustive experimental research on the comparative toxic powers of cocaine and eucaïne (see *British Medical Journal*, March 27, 1897). He found that the lethal dose of cocaine for a person weighing say 150 pounds was approximately $4\frac{1}{2}$ grains, and of eucaïne for the same person 6 grains, giving us as the relative dosage 3 of cocaine to 4 of eucaïne. By a considerable experience with cocaine in clinical dental practice I have found the dosage to be from $\frac{1}{8}$ to $\frac{1}{2}$ grain, and therefore on the basis of Prof. Charteris' experimental research I should expect the dose of eucaïne to be not far from $\frac{1}{4}$ to $\frac{3}{4}$ of a grain. From this it would appear that there is no very considerable difference in the quantitative dosage of the two drugs in dental practice. But in reality much larger doses of eucaïne are necessary to produce the same therapeutic effects than of cocaine. Therefore the toxic action and therapeutic values are practically equivalent, or so nearly so, that it will require a nice discrimination to give either the preference. My experience with the two drugs give me a somewhat different basis for comparing their therapeutic values and toxic actions. I find, for instance, that it requires an average of 10 drops of a 5 per cent solution of eucaïne to produce

the same effect as 10 drops of a 1 per cent solution of cocaine, which, as you will see, reduces the proportionate dosage of cocaine to eucaïne from 3 to 4, to 1 to 5, that is to say, that $\frac{1}{5}$ of a grain of cocaine in 1 per cent solution will be as effective as $\frac{1}{4}$ of a grain of eucaïne in 5 per cent solution. From this we find that we have a considerable latitude in favor of cocaine as regards its therapeutic dosage. If we can use safely 10 drops of a 5 per cent solution, or $\frac{1}{10}$ grain of eucaïne, on the basis of Charteris' experiments, we can use 37 drops of a 1 per cent solution of cocaine or $\frac{1}{38}$ of a grain. I have made my recent extractions and operations on pulps with this idea in view, and have uniformly good results from the use of the two drugs in the solutions and quantities given above. I have found, however, that when I have been able to make accurate injections the full dosage in quantity of solution is never required, and am led to conclude that for practical work cocaine has the advantage in quantity of solution required. This difference in results obtained in practice to those in the investigation noted above, is due entirely, I take it, to the physiological action of the drugs and the method of administering them, as well as the manner of making the solutions. A small dose of cocaine produces insensibility when used in dilute solution and is forced into the tissues by strong pressure from the hypodermic syringe; in this way we get the full effect promptly and locally of all the cocaine used because of the obtundent effect resulting from the narcosis and anæmia induced by the cocaine and the infiltration of the solution into the tissues. With eucaïne we have a greater obtundent effect because of the larger amount of eucaïne in the solution, but the eucaïne has no tendency to produce anæmia, except that which is mechanical and exceedingly transitory; on the contrary, its tendency is to hyperæmia, and the bulk of the solution is comparatively so much less that no mechanical interference with nutrition and function of the nerve takes place.

I conclude therefore that it is an advantage to dilute cocaine solutions to the lowest effective dilution, but that eucaïne solutions should be only so dilute as to give necessary bulk for proper administration, and to keep well within the dosage limit. I have not used to any extent less than 5 per cent solutions of eucaïne, because I don't see how it would be practical to reduce the strength and keep up its potency, and besides the injection of any considerable quantity of a dilute solution would produce a corre-

sponding increase of irritation and therefore a reduction of its potency; its obtundent action would be delayed.

It would seem therefore that so far as dosage and narcotizing influence is concerned we must concede the advantage to cocaine.

There are, however, other considerations which we should consider in passing on this subject. The systemic effects from the hypodermic use of these two drugs are different, and although systemic effects are not intended yet they may be expected even when small medicinal doses are used. Cocaine especially has decided tendencies to bring out dormant nervous disorders or peculiar idiosyncrasies resulting from derangement of the vital organs. Various manifestations of hysteria are almost certain to appear under the exhibition of cocaine, even in exceedingly small doses. Many practitioners who have begun to use cocaine have met these symptoms and owing to their disagreeable nature they conclude that cocaine is not a suitable drug to use, and abandon it without adequate trial. These are incidental or by-effects and should not be confounded with the toxic symptoms which appear in excessive doses.

The most susceptible and first affected organ is the cerebrum. Regular and safe doses produce on this organ a soothing or calming effect at first, and a feeling of ecstasy or delirium ending in a peaceful quiet. If, however, a toxic dose is administered or a toxic effect appears, or even one of the by-effects, due to a peculiar neurasthenia of the patient, the symptoms are not so simple or quieting. The patient becomes restless, anxious, increasing to terror, and if a lethal dose has been given, convulsions, probably of cerebral origin, but which may result from asphyxia. This toxic action always affects respiration and may be diagnosed by noting the condition of respiration and the general tendency to muscular agitation.

It is highly important, in view of the fact that it occasionally happens that we are called upon to correct the excessive dosage of effects of cocaine, to know that cocaine narcotizes the cerebral and cord sensory functions before it does the motor, rendering it possible by the use of motor stimulants to keep up vital functions, even under prostrating doses of cocaine or when the reflexes have failed. It is because of these facts that we find morphine an excellent agent, not only to quiet the excitement of the nervous system, but to sustain under moderate doses vital function. The

addition of atropine has not only the corrective effect on the morphine, but helps materially to sustain respiration and circulation by a central action. The danger in cocaine lies largely in the fact that it acts so promptly, or rather suddenly, not slowly as morphine and other nerve depressants. Hence the importance of administering before, or at least with it, agents which will counteract its tendencies before the nutrient functions are so far interrupted as to make it impracticable to bring them to bear on the depressed tissue or organ. The most powerful motor stimulant known to us which will affect the cord is strychnine, and naturally we find that it is the most powerful and certain drug to induce resuscitation after the vital functions of respiration and circulation have succumbed to the depressing influences of cocaine. It is not given as a preparatory treatment, or in combination with cocaine; but only when the reflexes will not respond to the influence of the volatile or mechanical stimulants, and when continued artificial respiration is necessary, to keep up the respiratory function.

The dose is from $\frac{1}{100}$ to $\frac{1}{50}$ of a grain of the sulphate of strychnine in a dram of water injected hypodermically. The depressant effect of cocaine is almost always experienced in the respiration first and secondly in the heart circulation. Strychnine is both a valued heart and a respiratory stimulant, because it stimulates all the vital motor center located in the medulla oblongata. Where it is known that the heart only is affected, because abnormally weak from disease or from any functional cause; the natural heart stimulants such as digitalis or strophanthus would be indicated as they would not excite other functions unduly. If the alkaloid salts are used $\frac{1}{80}$ to $\frac{1}{40}$ of a grain of digitalin or $\frac{1}{120}$ to $\frac{1}{60}$ of strophanthin should be dissolved in water and hypodermically injected. The doses of the tincture would be from 5 to 15 drops of digitalis and 3 to 10 of strophanthus. Caffeine is probably as good a circulatory stimulant as we have; to get the best results it should be administered immediately before or at the time of the cocaine. It has wonderful sustaining properties. 2 to 4 grains of caffeine citrate will answer.

The troublesome symptoms of cocaine exhibit themselves frequently when the dosage has been small and in accordance with their intensity in about this order: First a mental or cerebral excitement taking the form of hysteria, second in epileptic convulsions if there has been administered an overdose. These

convulsive symptoms may be very slight, confined to some particular part of body or they may affect the entire system. If they are secondary to the effect of the drug on respiration they will only appear in connection with effects on the respiratory function and will be relieved when this condition has received attention. Usually these symptoms are brief in their duration and need no treatment. Chloral is a good antidote for these conditions. The third and most serious manifestation is from complications of respiratory and circulatory depression. For this the respiratory reflexes should be shocked with volatile irritants, such as ammonia spirit or amyl nitrite. When this is not effective or sufficiently prolonged, artificial respiration should always be kept up if the respiratory function is weak or abolished. Central stimulation with strychnine is available to continue the respiration until the cocaine influence is removed from the system. Warmth over the region of the heart and position favoring circulation and elimination from the system of the poison will all be practicable and valued restorative measures.

The toxic effects of eucaine will appear along the same lines. It is however claimed that eucaine does not produce the same nervous phenomena and is not so sudden or erratic in its action as cocaine, and it is that fact that makes its use more promising as an agent that can be used successfully for dental work. However, the drug has not yet been sufficiently tested to determine these points definitely. The same restorative drug will be available and indicated to meet the symptoms of eucaine poisoning as for cocaine.

The advantages of eucaine over cocaine are to be found first in the fact that it is more uniform in its action, that is to say personal idiosyncrasies do not modify its regular action to the same extent they do cocaine. It also produces a more prolonged anæsthesia, but this is probably due to the fact that we use it in greater concentration and there is no ischæmia as with cocaine, and only slight advantage taken of the infiltration idea.

The peculiarities of eucaine are that while it produces the same sedative effect on the sensitive nerve endings, it depresses the vaso-motor system and dilates the circulatory system locally, while cocaine by stimulating the vaso-motor system locally depresses the circulation. Eucaine depresses the heart's action and circulation while cocaine excites it. More hæmorrhage follows the use of

eucaïne than cocaine. It is especially desirable that all eucaïne should be expressed or bled out of the tissues after operating that it is possible to remove, in order that the consequent stasis shall be overcome and the liability to necrosis and slough prevented. In fact it is equally desirable to remove cocaine solutions for the same reasons and also to prevent further systemic absorption. The dilute solutions of cocaine will, however, be more readily removed than the concentrated eucaïne. In all cases wounds should be thoroughly washed with clean hot water and sterilized as thoroughly as is practicable.

The injections of eucaïne will induce more pain than cocaine because of the hyperæmic condition induced.

My experience with eucaïne led me to the conclusion that it should be combined with some suitable antiseptic for injection into the gum tissues, as it is not practical to thoroughly sterilize it by boiling the solutions. I have had two cases of bad sloughing of the gum and some exfoliation of the alveolus, which I can't attribute to the presence of sufficient eucaïne left in the gum tissue to cause it, as in each case I used only about ten drops of the 5 per cent solution and was careful to wash the cavities thoroughly after expressing by pressure with my fingers all that I could. Just what the best substance for this purpose is I can't say. I have tried boric acid and hydro naphthal. Hydro-naphthal is too irritant and increases the hyperæmic action of the eucaïne, and the boric acid I fear is not sufficiently powerful, although it may prove sufficient in connection with boiling the solution.

A new local anæsthetic called holocaine is now being tried in ophthalmic practice with promising results. It is used in 1 per cent solutions of the hydrochlorate and seems to have much the same action as eucaïne (see *American Medical Surgical Bulletin*, June 25, 1897, page 577). The advantages claimed are longer periods of anæsthesia, freedom from toxic effects, and with no necessity for sterilizing the solutions, as the holocaine itself is strongly antiseptic.

The therapeutic value of these preparations will be found in all operative procedures about the mouth where they can be practically applied, and their value will only be appreciated and available by those who are willing to undergo the time and trouble necessary to master their peculiar characteristic actions when used and who are willing to take the time and trouble to apply them even

in cases where the patient does not demand them. Their greatest uses will be in connection with extracting teeth, extirpating of pulps, obtunding hypersensitive dentine, and other operations on the soft tissues of the mouth. I cannot take your time to indicate the many useful applications about the mouth. It is practically impossible without subjecting our patients to great pain to clean a set of teeth properly without using these agents, to say nothing of treatments of pyorrhœa, lancing abscesses, excising hypertrophied gum, implanting teeth and surgical procedures of various kinds.

These agents have come to stay, and we might as well make up our minds to it first as last, and since they are so powerful, we must exercise the greatest caution and skill in applying them. Cocaine, doubtless, has found its greatest use in connection with the extraction of teeth and it here meets its severest test. For this purpose it should never be used in over a 1 per cent solution and as a rule not over $\frac{1}{2}$ grain of the drug should be employed at one time, unless there is special provocation, when the system should be well fortified against its physiological action. It is best administered about an hour after a meal or soon after drinking a cup of strong coffee or a dram of whisky.

Nervous and hysterically disposed persons are the most unfavorable; and persons with strong and vigorous respiration and circulation the most preferable. Children and old people are unfavorable and should be given small doses. With nervous or excitable patients the demeanor of the operator means much toward a successful administration. The combination with suitable corrective drugs is of the greatest value. Such drugs as will counteract especially the delirium tendencies and depressant actions on the respiration and circulation.

Endeavors to combine with these drugs some agent which shall localize their effects, have not met with any considerable success. The best agent of this class is carbolic acid, but its tendency in these solutions is to produce local stasis and œdema resulting in necroses and sloughs that are exceedingly difficult to heal. My experience leads me to conclude that it is better to depend upon smaller doses and more attenuated solutions until some limiting drug is found which will not produce these deleterious results. I, however, haven't much hope of finding such an one as the very idea implies the effect that I have indicated as undesirable. If unfavor-

able symptoms result from systemic absorption, take care of them and meet them with proper antidotes. I still find after several years' use of a combination of cocaine, morphine and atropine about as satisfactory a combination as it is practicable to make, although I sometimes have unpleasant tendencies resulting from the presence of the morphine with patients who are peculiarly sensitive to this drug. You will find all three of these drugs will each assert itself at times in a way that is not justifiable when the dose is taken into account. Being careful to keep well within the bounds of a proper dosage and content to secure immunity from excessive pain or its reduction to a comparative minimum so that operations may be made tolerable I have used this combination with almost universal satisfaction. In favorable cases it is practicable to get absolute freedom from pain, in all a decided mitigation. In short, the aim to get an analgesic rather than an anæsthetic effect, has made the use of cocaine and eucaïne invaluable aids to me in practice.

In extirpating pulps this preparation has displaced all other methods with me, because of its certainty of action, ease, safety and great saving of time, and it is available for a larger proportion of cases met than any other remedy. I use only a 1 per cent solution injected hypodermically, although stronger solutions are available. Small and larger exposures, direct and obscure approaches, are amenable to this form of treatment, at a great saving of time and with as good or better results, when the same care is exercised in regard to the other and subsequent operative manipulations. It is possible to conceive of cases where this method would be inapplicable, but in practice they are few; such as inability to adjust the dam on a posterior tooth, impossibility of manipulation because of the position of the cavity, and the undesirability of making a more direct access, etc; but these same conditions will interfere with the success of any other method. Cocaine and eucaïne are both adapted to this work, and may be used singly or in combination with other drugs, as there is little probability of systemic effects and possible contra indications.

To reach pulps through distal or remote and inaccessible cavities I sometimes fill the cavity with a tight temporary filling and make a new approach from a favorable location, keeping in mind the necessity for instrumentation and complete access to the canals, also the future welfare of the tooth as respects its integrity.

The process known as the infiltration or *Sleich* method has

been suggested as a practical one for dental operations, and can be utilized in some cases. Its chief merit is in the small amount of cocaine it contains, consequently being less toxic than other solutions. The method of using also involves the idea of self-limitation of cocaine in the immediately contiguous tissues where injected, thus insuring against the systemic action of the drug. The solutions contain only about one-tenth of 1 per cent of cocaine and morphine in sufficient quantity to act as a corrective, and chloride of sodium sufficient to render the solution more readily transmissible through the cellular structure of the skin and mucous membrane. Somewhat extensive surgical operations have been made with this method and without pain. The disadvantages of the method in dental practices are that it requires a considerable time to make the injections to secure the abrogation of pain. It requires for instance a very much longer time to infiltrate the gum and peridental tissues sufficiently to make it possible to extract a tooth without pain than it would to infiltrate the soft tissue where there was no bony environment. The limited area available for infiltration about the teeth is also an objection, as hypodermic injection if made beyond the gum tissue into the buccal membranes is liable to produce anæsthesia of the buccal tissues rather than of the gum and also to produce irritation and prolonged effects of the cocaine. Another objection comes from the method of making the injection. The injection is made immediately under the superficial layer of the mucous membrane in such a way as to separate it from the underlying tissues almost entirely. The result is that this epithelium dies and sloughs off, leave a tender or sore tissue which heals with difficulty. The most desirable use that I have made of this method is in extracting the lower third molars and in excising the gums over emerging third molars, or lancing abscessed teeth. Its value here depends on the anatomical relations of the tissues and their character. Where the gum is thick, vascular and exceedingly cellular and loosely attached to the jaw bone, efforts to inject parenchymatously will subject the patient to a larger dose of cocaine than is desirable. It will collect in the pockets around the tooth or run through into the mouth to be swallowed by the patient, and as a consequence induce anæsthesia of the accessory muscles of respiration, giving your patient apprehensions of some impending calamity. The excessive vascularity of the gum, lower third molar region,

makes rapid absorption and systemic effects possible before local anæsthesia has taken place. Hence the weaker solutions confined to the superficial tissues will likely prove more effective and least poisonous.

The infiltration idea can be applied with great satisfaction in injecting pulps. It is generally supposed that stronger solution should be used because they can be without danger and with definite results. I find it entirely practical to narcotize pulps sufficiently for extraction with 1 per cent solutions, particularly if it is possible to get a deep and firm insertion of the needle, so that sufficient pressure can be made and the solution will not follow back along the sides of the needle in place of penetrating the pulp structure. If it is not possible to get a secure seat for the needle it is better to use stronger solutions.

I generally apply a strong solution of carbolic acid to the pulp just previous to inserting the needle, to take off the sharp pain incident to the insertion, and should there be considerable sensitiveness, or the patient particularly susceptible, take time to allow a local application of powdered eucaïne or cocaine to dissolve in the pulp serum and be sufficiently absorbed; five minutes spent in this way while getting the solution ready for injection will often make the operation entirely satisfactory to both patient and operator.

The application of cocaine and eucaïne by electrical infiltration methods is important although limited in its sphere of practical usefulness. Its most important use is in obtunding the sensibility of dentine. It has been used in anæsthetizing pulps and for surgical procedure about the mouth. But the danger of producing electrolytic cautery or necrotic results almost bars it entirely for operations on the oral tissues. For extirpating pulps it has met with some favor, but the tardiness and uncertainty of its action has caused its abandonment largely in this class of work, except in special cases, where because of excessive irritability of patient or extreme exposure and sensitiveness of the pulp it is impracticable to make hypodermic injections and toxic results have also been reported, coming either from the infiltration of the absorbent vessels about the roots of teeth with excessive quantities of cocaine, or because of the electrolytic action upon the peridental tissues, and as some believe to the forcing through the tooth of resultant putrefactive poisons from partly decomposed pulps which have been

subjected to the cataphoretic current which carries in it from the pulp canal into the submerged tissues the infectious ptomaines which cause irritation, inflammation and possibly necrosis. The great difficulty lies in the fact that this agency for carrying remedial drugs into infected tissues is not well understood even by electrical scientists themselves and in the hands of a dentist who lacks power or inclination to make a clear and satisfactory diagnosis, and who also knows next to nothing about electrical science, it is no wonder that we have so many disastrous failures and discouraging reports to hold us back from availing ourselves of excellent therapeutic agents. But these mistakes of the ignorant or careless ought not to weigh too heavily against earnest endeavor and diligent search to determine whether any good can come from the use of this or any other agent. The reaction which seems to have set in against cataphoresis is not discouraging. It is to be hoped that it will check the indiscriminate use if not abuse of this excellent means of obtaining freedom from pain in operations where it is almost essential that the pain should be reduced to the minimum.

The use of cocaine and eucaïne by cataphoresis, or electrical osmosis, is exhibited probably at its best in obtunding sensitive dentine. It has never been possible or practicable to obtain insensibility of dentine with any former methods in a reasonable time without considerable preliminary pain or periling the vitality of the tooth. Strong cauterants, intense cold, high, dry heat are prompt and practical methods for obtaining in a measure this result, but all are liable to induce irritable and possible inflammatory results in tooth pulps ending in their destruction. But by the infiltration of medicinal narcotics by the cataphoretic method we have a comparatively safe and definite result with a minimum possibility of bad secondary results. The principle of cataphoresis as at present used is sufficiently well understood to make its application for obtunding dentine with some substance, such as cocaine for instance, easily understood and with a limited experience good results may be had by any one. It is however found that all substances do not pass with the current from positive to negative, and the infiltration cannot be made in the same manner with all substances. Luckily, however, cocaine is not easily decomposed and passes with the current through the dentinal tubuli to the pulp in its active therapeutic form.

Some dentists, notably Dr. Bonwill, assert that the cocaine has little or no influence in producing the narcotic result, but that

it is due to the manner of the application of the current. Dr. Barber, of Toledo, informs me that he has obtained unquestioned obtundent effects by reversing the current, using no narcotizing drug whatever except a little saline solution to induce contact and insure continuous flow of the current. It is also well known that in the decomposition of compound drugs the elements will appear at different poles of the battery in accordance with well known physical laws, and an effort is being made to show that the process of obtunding dentine by electrical currents is complicated and obscure, and that success and failure to secure results are due to the fact that these phenomena are not taken into account in our proceedings. I cannot sympathize with the recently promulgated idea, that obtunding sensitive dentine with cocaine used cataphorically, is due to the electrical decomposition of the cocaine, its transmission to the pulp on the principle of convection by "ions," and reformation there in its compound and patent form. It seems illogical and unscientific. It is more probable that molecular cocaine is electrically charged and so increased endosmosis. I have no doubt we shall know more about these phenomena as time goes on; but I don't think it is necessary to take any special notice of them in our efforts to obtund sensitive dentine with the electrical current and cocaine, for the reason that cocaine is not decomposed to any considerable extent when used in connection with an electrical current which is only sufficient to cause its absorption and passage in the direction with the current itself, and which under proper regulation will be in the path of the least resistance, or through the dentinal tubuli to the pulp, where it immediately becomes effective in allaying the sensibility of the entire tooth so far as this sensibility is supplied from the pulp. It is to be hoped that no one will abandon the use of this valuable method of obtunding sensitive dentine because it occasionally does not seem to meet the requirements of the case in hand, with the idea that the method is complicated or intrinsic, and no one but an experienced electrician should attempt its use. Few of us are sufficiently scientific to comprehend the many mysterious phenomena exhibited by this subtle agent, and none of us understand all of them. But we do know that in a great many cases it can be applied successfully to obtund the extreme sensibility of the dentine with certainty if not with dispatch. The methods of manipulation are so well understood, and as I have nothing new to add on the subject, I will not here rehearse them, as undoubtedly many of

you have had a larger experience than I and know more of the subject. I want, though, to make a strong plea for cataphoresis as a valued method of obtunding sensitive dentine, and to ask those who have been disappointed in its use not to discard the apparatus, but to keep it at hand and make use of it on the principle of inducing absorption of cocaine by the dentine, or as an appliance for causing the cocaine solution to penetrate the dentine to the pulp in sufficient amount to induce narcotic results. The discouraging features of this method are: The time consumed, danger of producing electrolytic effects on contiguous tissues because of carelessness in not obtaining complete isolation of the tooth and the difficulty of determining when sufficient effect has been produced to make the operation without pain and without endangering the vitality of the pulp because of the excessive dosage. It seems to me all these points should be eliminated by experience under the direction of wise and thoughtful experimentation. As a general thing children's teeth, poorly calcified teeth and thin layers of dentine over the pulps will indicate either shortened application or mild currents, or both; and if we can be content to confine the use of this method to obtunding sensitive dentine, and are willing to be patient, I am sure it will prove an excellent servant. Except in the hands of the most skillful, I do not think it will ever be of much value as a medium for applying remedies to the softer structures of the mouth or for extirpating pulps, except possibly as a preliminary treatment to reduce excessive irritation of the peripheral portion of the pulp, preparatory to its injection hypodermatically. I conclude that cocaine is among our most valued medicinal helps, and when well understood and properly used will be most highly valued, and applied for the good of all.

SOME POINTS RELATING THE ORAL CAVITY TO THE EYE, EAR, NOSE
AND THROAT.*

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Dentists cannot be considered specialists in medicine. They constitute a profession by themselves, for a specialist in medicine is one who by reason of having completed a full course in a medi-

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cal college has obtained the degree *doctoris in medicina* and in practice confines himself to a branch or several related branches thereof. He must be more or less versed in the anatomy, physiology and pathology of the whole system, for the diseases he is called upon to attend are often complications of some malcondition in another part of the body which must be recognized in order to obtain successful results. A gynecologist who is unfamiliar with the diseases of the liver and kidneys or does not recognize the possibility of symptoms referred to the ovaries as being due to some anomaly of the nervous system, would indeed be a dangerous practitioner to consult; or an ophthalmologist who is unprepared to recognize any of the numerous diseases which have an etiological bearing upon various ocular malconditions, would be no better prepared to treat the eye than an optician.

On the other hand many of our best dentists have never had a medical college training, which in itself is sufficient evidence that a dentist need not be a physician to attain success. The most essential quality conducive to good results in the practice of dentistry is mechanical ability, for most of the work which lies within the domain of the odontologist requires mechanical skill of the most accurate and delicate character. The man, however, who has this gift and with it combines the knowledge of a physician must be better qualified to battle against the various ills and deformities which infest the teeth of mankind, than he who is a mechanic only. But much of the study necessary to obtain the degree of M. D. would be useless in the practice of dentistry. What practical benefit for instance can it be to a dentist to know how to insert a Murphy button or to correct a retroverted uterus? That which he would learn and which would give him a certain advantage over his colleagues can, however, and should be a part of the acquirements of every dentist, and this knowledge can be gained without taking a college course.

These points of connection between medicine and dentistry, which may be termed the medical part of dentistry, suggest certain subjects which physicians and dentists can discuss in common.

Extensive researches in bacteriology have been made by dentists as well as physicians, and have brought forth much valuable information in determining the etiology of decay and other diseases of the teeth. The practical application of bacteriology in surgery, asepsis, is and should be followed as strictly in the practice of dental surgery as in any surgery of the body, and

especially in operations involving the gums and mucous membranes of the mouth.

It is impossible to render the mouth absolutely aseptic, but the greatest danger of sepsis lies in the introduction of pathogenic bacteria through the medium of instruments and hands, and it is therefore the duty of every dental as well as other surgeon to clean his hands and instruments before operating.

Surgeons have been too much inclined to overestimate the value of chemical antiseptics, and to underestimate the value of mechanical agents. It should be remembered that scrubbing the hands and nails by means of a brush with ordinary soap and hot water will rid them of many bacteria and much of the material in which germs live and propagate, and will prepare the hands for the application of antiseptics. Indeed, if an operator had to choose between soap, brush and water, and any of the antiseptics that are used for sterilizing the hands, he would best to choose the former.

The best and only safe way of making instruments aseptic is by the application of heat. A quick way of sterilization is to hold the instrument in a flame, or a less harmful procedure is to immerse it in alcohol, and ignite the fluid. Of course, the best routine means of sterilization is to boil or steam the instruments; and every dentist should be provided with a sterilizer, preferably a steam sterilizer, which can also be used to prepare cotton or other dressings.

"Ordinarily," says McFarland, "bacteria are unable to resist a temperature of 60° C for any considerable length of time, only a few resistant forms tolerating a temperature of 70° C.," and "a temperature of 150° C. is sufficient to kill all known bacteria and their spores if continued for an hour."

Practically it is only necessary to boil the water in a steam sterilizer for five minutes to make instruments aseptic.

The fact that septic inflammation follows the extraction of teeth so infrequently even when forceps are used which have not just been sterilized, can be accounted for by the profuse bleeding which follows, the blood acting mechanically and chemically as an antiseptic. The comparative rarity of such a misfortune does not excuse the operator from using aseptic precautions in performing extraction, however.

In my experience in treating acute inflammation of the mucous membrane of the eye, ear, nose and throat, I find almost invariably that the best results follow free catharsis, and it is my

custom to prescribe in these cases something to produce a free evacuation of the bowels and rid my patient of accumulated fecal matter, which is becoming absorbed and acting as a poison to the whole system. The results that follow are sometimes magical, and I cannot but believe that many cases of toothache and especially those of a neuralgic character would respond equally well under like treatment. If those who have not done so will prescribe for such patients the following prescriptions :

R. Hydrarg chlorid mite.....grs. ijss
 Ipecac.....grj.
 Sodii bicarbonat.....grs. xij
 M. et ft. pulv. in chart..... xij dividen
 Sig. One powder every half hour. Follow in the morning with a dose of a saline cathartic.

I think they will attain more satisfactory results than by using local treatment only. Many of the acute inflammations of these regions can be traced to a rheumatic diathesis, and such cases in addition should be given the following :

R. Salol.....grs. ij
 M. et ft. pulv. in chart.....xxiv dividen
 Sig. One every three hours during the daytime.

These lithæmic cases are also benefited by hot local applications. When the pain is due to an abscess, there will not be complete relief until the pus is evacuated, but there are many cases of nonsuppurative inflammation, and it is these that I refer to in particular.

As local treatment in earache before an abscess has formed, there is nothing so beneficial both in relieving pain, and in cutting short the attack as depletion, oftentimes, likewise, free incision in the vicinity of an aching tooth, will give relief. Counterirritation is a well-tried remedy for odontalgia, but it should be remembered that a raw surface is produced by the use of irritants and that such poisonous remedies as tincture of aconite should not be applied subsequently, as absorption may take place as readily as if the remedy were given hypodermatically. I once had the misfortune while away from home to have the toothache, and I consulted a dentist in the neighborhood who thought that local applications would bring relief. He stated that he had obtained great success with a new treatment which he would give me the benefit of. Relying upon his judgment entirely, I told him to proceed. Accordingly he made what I found afterward to be a free application of creosote to my gums, followed by tincture of aconite. I went back

to my rooms which were only a few blocks distant, and suffered an attack of aconite poisoning, which was far more unpleasant than the toothache. Strychnine, whiskey and time brought me around, but the tooth came out the next day, although the inflammation was only a traumatic attack, and the tooth might have been saved. Of course the creosote simply produced a raw surface and the aconite became immediately absorbed into the system.

An accident which happened to the author while practicing medicine in a town where there was no dentist and which may befall any operator, was the severing of the mental artery while extracting the root of an inferior cuspid with alveolar forceps. Strong styptics were of course of no avail, and it was necessary to catch the vessel with the artery forceps and ligate it, before profuse hæmorrhage could be checked. To control bleeding from such a large vessel would be extremely difficult without artery forceps, and the operator who meets with this accident would find himself much embarrassed without this handy instrument. A pair of artery forceps would therefore be a valuable adjunct to a set of extractors.

Neuralgias occurring along the course of any of the nerves are perplexing, because their cause is often so remote from the region of manifestation. And nowhere is this fact more prominent than in neuralgia occurring along the course of the trigeminus which has such a large field to supply, and such a variety of functions to perform.

It is a nerve, not only of common sensation and motion, but to a certain extent of special sense. "It is the great sensitive nerve of the head and face, the motor nerve of the muscles of mastication and its lingual branch is possibly one of the nerves of the special sense of taste. The Gasserian ganglion lodged in the petrous portion of the temporal bone is formed from the sensory portion, and receives filaments also from the carotid plexus of the sympathetic and from it fibers connect with the tentorium cerebelli and the dura mater in the middle fossa of the cranium. Three branches proceed from the ganglion—the ophthalmic, superior maxillary and inferior maxillary. These nerves, the two former of which are solely nerves of sensation, by means of various and numerous branches and ganglia which they help to form (ciliary, sphenopalatine and otic) supply the eye, ear, nose, throat, mouth, teeth, face, etc. Their communication is so intricate that a lesion of any one of these structures may produce pain in another.

Thus it is almost invariable that an operation upon the anterior cartilaginous nasal septum will produce neuralgia in the superior anterior teeth. And we sometimes witness a similar neuralgia of these teeth when there is ulceration of the septum. This is due to the fact that the anterior portion of the septum is supplied with fibers from the nasal branch of the ophthalmic, which join with the nasal branches of the superior maxillary which supply the upper teeth. Communication of like nature exists between the teeth and the ear, so that it is quite common to have a lesion in a tooth cause a patient to consult an aurist, and vice versa.

In making a differential diagnosis in these cases, we have two prominent points to aid us, viz.: 1. A defective, or a nonerupted tooth, about which symptoms of inflammation may be observed, and 2, no inflammatory symptoms excepting pain in the region of the manifestation of the neuralgia.

These points may be depended upon in neuralgias of the middle ear and eyeball, excepting in earaches occurring from difficult dentition when either the reflex process leads rapidly to trophic changes, or on account of the continuity of the mucous membrane of the mouth with that of the bony Eustachian tube, and tympanum, the parts become inflamed by contiguity.

I desire to say a few words about the mouth breather before closing.

The protruding V arch is one of the commonest forms of irregularities which an orthodontologist is called upon to correct. The cause is well known; this deformity is due to mouth breathing. And mouth breathing results only where there is some occlusion to normal nasal respiration. This may be due to polypi or hypertrophies in the nose, but it is usually caused by adenoid vegetations in the naso-pharynx, which during the period of the development of the teeth forms a complete occlusion to nasal breathing. At puberty or maturity by reason of an enlargement of the parts and a shrinkage of the growth, nasal respiration may be established.

For this reason some physicians advise noninterference, telling the parents that the child will outgrow the trouble. If we grant this to be true in some cases we cannot admit that it is safe to allow this disease producing vegetation to remain in the naso-pharynx to cause not only a deformed arch but a consequent deflection of the nasal septum which may itself close the anterior

portion of the nose. But these abnormalities are of minor consequence when compared to deafness produced by closure of the Eustachian tubes, and the induced chronic middle ear inflammation, or suppuration of the middle ear, with a continual liability to mastoiditis and death. Or following the course of the respiratory apparatus producing a bronchitis and weakened lungs, by inhalation of unfiltered, unheated and unmoistened air.

The nose has very important functions to perform, and anything which interferes with these functions endangers the health of the patient. It is, therefore, of the utmost importance that these growths, which interfere with the health of the child, be removed as soon as possible, and as these cases come into the hands of the dentist for correction of the deformity, he will often have an opportunity to advise them, and will find the establishment of nose breathing to be a necessary adjunct to the production and maintenance of orthodontia.

SUGGESTION IN ITS RELATION TO DENTISTRY.*

By H. A. PARKYN, M. D., CHICAGO, ILL.

While the object of my paper this evening is to advance a few practical hints for the use of suggestion in dentistry, still I am going to pay a passing tribute to hypnotism.

The word suggestion is every day being given a broader meaning, and we now speak of any impression which may be received through one of the senses, as a suggestion. This being the case, it is very clear that our whole education and reason depends upon suggestion, for every thought we possess is the result of an impression, or the association of impressions, which have been received through the senses.

Hypnotism, or what has been generally known as hypnotism, is simply nothing more nor less than suggestion. I could not very well prepare a paper on "hypnotism in dentistry," for, as a matter of fact, theoretical and practical psychology, as well as my experience with suggestive therapeutics, has shown me that there is no such condition as hypnosis, and therefore there can be no such science as hypnotism. The term is a misnomer—it conveys a false impression when we use it to describe the condition we have heretofore called the hypnotic condition. We have many Puritanical

*Read before the Odontographic Society.

ideas in our present systems of medicine and religion which are gradually being recognized and rooted out. It is not so very long a time since it was considered wrong to do anything which might afford us amusement. It was almost a crime to smile upon the Sabbath day to say nothing of whistling, and unless a medicine prescribed to a patient was very obnoxious it was considered of little value.

A good old Puritanical doctor attending a convalescent patient was generally heard to say such things as this: "Well, now, you have pulled through very nicely and you are in a position to digest perfectly any article of diet you may choose. Now tell me, what would you like best in the world to eat? Simply name it and your wish will be gratified." The patient, having named the longed for article, is surprised to find the effect his reply has made upon the good old family physician, for in an instant the old physician's manner is entirely changed, and he replies, "Nonsense, man, are you crazy? Why didn't you name anything in the world but that?" And so the old fellow would go along until several other articles of diet had been named and finally, when, with a great deal of reluctance, one had been agreed upon, the patient was allowed to have it, only under certain restrictions.

It is in this same way that the absurdities and fallacies of Mesmerism and Braidism are present to-day in suggestive therapeutics, or, as it is more generally, though incorrectly called, hypnotism; and it will be my pleasure in passing to point out a few of these popular fallacies, although I must say they are still held as truths by a great many who are giving much attention to this work.

Hypnotism is generally interpreted as the art or science of inducing sleep. The latest scientific definition for it is, that it is a condition in which a suggestion has an exaggerated effect.

Mesmer, over a hundred years ago, induced a certain trance condition in some of his patients, and to all appearances they slept. Braid, who also found nothing but this same trance condition, not understanding suggestion, fancied his patients actually slept.

Knowing nothing about the lighter stages of suggestion, Braid and Mesmer believed that if their patients were to be benefited by this unknown force it was necessary that this sleep condition should be induced, and at the present day we find the large majority of those who use suggestive therapeutics endeavor to get their patients as nearly to sleep as possible, when, as a matter of

fact, the so-called hypnotic condition is not one of sleep, nor is the deepest hypnotic somnambulist ever in a condition of sleep unless he passes into natural sleep, and in natural sleep it is impossible to get any evidence that a subject is obeying a single suggestion, for as long as he is obeying suggestions he is not asleep.

The depth of apparent sleep, in place of being an essential as generally supposed, is only a symptom of suggestibility. To ascertain the depth of this suggestibility, the suggestions may as well be directed toward accomplishing any other results in the individual.

When an individual is actually asleep it is impossible to get him to give any sign, at the time suggestions are being given, that he is receiving them, for should he obey a suggestion which would require the action of a voluntary muscle he would be awake. During sleep one is not conscious of any impressions received by the senses, and just as soon as one does become conscious of the impressions received through any one of the senses, all the senses become active and the patient is awake or in a reasoning condition. It is therefore impossible for one to sleep and still receive impressions through the senses and remember those impressions in their minutest details, as the hypnotic somnambulist is supposed to do. Consequently the hypnotic somnambulist is never asleep when he is obeying suggestions, of which he is afterward conscious, or which may be recalled to his consciousness when it is suggested that he can remember them.

These somnambulic individuals will say that they have been to sleep or that they remember nothing which has occurred; but they will remember everything, when it is convenient for them to do so, or when it is suggested that they shall do so. They will also say that they were in Mars, or in the moon, and they do this, simply because the operator said they had visited these places. It is for this same reason that they say they are asleep or any other absurd thing—because the operator said so, and not because they were or believed they were either asleep or in Mars or in the moon.

If what I have been telling you about hypnotism is true, the sooner we avoid the word entirely the better. It is meaningless and absurd, and is like a dog with a bad name. There is much difference to the mind of the average individual between "anæsthesia induced by suggestion" or diversion of the attention and

hypnotic anæsthesia; for, while the first is almost meaningless to him and arouses no antagonism, the second calls forth visions of all that is horrible, criminal and uncanny.

To obtain the desired therapeutic effects I like to use suggestion with those who are at the start least suggestible, for when a patient is found to be very suggestible he generally makes a good somnambulist; and while it is with somnambulists that nearly all great miracles are performed, still when the degree of suggestibility of these somnambulists is understood these miracles lose all their luster. Remember that it is on account of the very suggestibility of this class of patients that the trouble which was so miraculously removed was present. It has been my experience that when a somnambulist has a genuine ailment it is more difficult to accomplish results with him than with one much less suggestible.

The induction of anæsthesia does not depend upon the degree of suggestibility of the patient but upon his preconceived idea of pain and his interpretation of sensations. It is impossible to induce anæsthesia in the deepest somnambulist if he is a physical coward, whereas with a patient who is not a physical coward anæsthesia may be very readily induced, although the patient may not be at all suggestible.

The only condition into which it is desirable to get your patients is a condition in which every suggestion you give him has extra weight, and this is most readily done by shutting out as nearly as possible all the senses but the sense of hearing. To do this, make your patient comfortable, thereby quieting the sense of touch. Have no odor in the room, nor allow the patient to keep anything in his mouth. Then ask him to close the eyes; and the only sensation left active is the sense of hearing and every suggestion given in this condition receives his closest attention. If your patient is a somnambulist you will find that if you suggest that his hand is burning you will get a practical result instantaneously without mentioning the word sleep to him.

It is surprising how many people will go into an anæsthetic condition induced by suggestion. I would not care to offer an estimate of the percentage of all comers in whom this condition can be induced, suffice it to say it is large enough to warrant the attempt in every case in which it is desirable to induce anæsthesia for dental operations, and suggestion may be very successfully

used with absolutely every patient who enters a dentist's chair. The only way to tell whether it is possible to induce anæsthesia or not in any patient is to test for it, and this may be very easily accomplished.

I am going to read you a telegram I clipped from a newspaper a few days ago, and it is one of the strongest arguments I could advance in behalf of suggestive anæsthesia. The telegram was headed: "Died at the dentist's. A Kingston woman dies under chloroform administered by her physician." Kingston, Ont. "Mrs. Sullivan, aged fifty-nine, a resident of Wellington street, went to a dentist this morning and had her medical attendant administer chloroform. Before the dentist could operate the woman died. She was the mother of Mrs. Georgeghan and Mrs. Captain Fleming."

Although the number of deaths occurring under chloroform anæsthesia in dental operations is a small one, still, if the use of suggestion as an anæsthetic will decrease this number in the slightest, it should always be the first thing employed, for whether it succeeds or not, it is never dangerous and it is never followed by "aftereffects."

I consider it the duty of every physician, surgeon and dentist to urge its use in every major or minor operation. Of course not every surgeon or dentist is acquainted with its use, nor will every patient permit its use if he knows what is going to be attempted. Indeed, only to-day a successful young dentist told me he had lost several patients through advocating suggestion. However, if a surgeon, or a dentist who is about to perform an operation on a patient has a knowledge of suggestion, and his patient is willing to have the anæsthesia for the operation induced by suggestion, it would be nothing short of criminal for him to administer any other anæsthetic until that had failed. Especially would I advocate its use in the aged and those suffering from heart, lung or kidney troubles, and patients possessed of certain idiosyncrasies.

Speaking also, from what I know by experience to be true, of the practical uses and possibilities of suggestive therapeutics, I consider that it should be a duty of any government to demand that every physician, surgeon and dentist under its jurisdiction, have a thorough knowledge of this science. I consider also that its practice for therapeutic purposes should be confined to these professions, for while any one may learn "how to hypno-

tize" still, when hypnosis is employed by those who are ignorant of the importance and indications of different symptoms of disease, it becomes a very dangerous plaything, and not one whit better than "Christian science."

"Suggestive therapy" has its limits and these limits can be defined by physicians only. Suggestion is but one important factor in the practice of medicine, but the ignorant enthusiast makes it "the whole thing" and treats everything alike regardless of cause or symptoms. In this way no doubt, many a patient while undergoing "suggestive" treatment at the hand of an "all mind quack" suffers along indefinitely, all the while hoping for relief from a condition which suggestion alone could not cure in a century. Frequently this loss of time enables a disease to obtain such a firm hold on the patient that when proper treatment is employed, the assistance comes too late.

It takes, as a rule, from five to twenty minutes to get a patient sufficiently anæsthetized for an operation. I generally use vigorous suggestions, sometimes urging the patient to hurry his respirations, until his head is swimming; or I simply allow him to sink quietly into a numb condition.

If it is possible to begin an operation, it is safe to go right through with it, unless the patient himself says cease, and I have never heard this after an operation has commenced. If he is going to say it at all he will say it at the beginning. True it is that I have seen patients give every evidence of pain—writhe, clenching the hands, teeth, etc., and it is here that so many operators lose heart and resort to another anæsthetic, pronouncing the trial a failure.

Patients, unless very deeply drugged, will writhe under any anæsthetic, and will arouse without any recollection of having suffered pain. And so it is under "suggested anæsthesia," for if a patient is left alone for ten or fifteen minutes after the operation, and suggestions of "no pain," "did not suffer," "no recollection of pain," etc., are given at intervals, it will be found that the patient will affirm that while he knew and felt what was going on, still he experienced no pain.

In testing for anæsthesia never say to a patient, "You don't feel anything;" "You can't feel that," for his conscience seems to say to him, "I do feel that;" but suggest to your patient, "You will feel this distinctly, but it won't hurt you;" "It won't hurt

you;" "Your left hand will be the indicator, and if it hurts you in the slightest you will lift it, but I tell you it will not be necessary, for this won't hurt you, although you will feel it," etc. Then apparently pinch one of his hands very hard and say, "See, now, that didn't hurt you although you felt it." Then touch him with the head of the pin and give the same suggestions, and lastly touch him with the point, and pinching up the skin, pass it clear through. If it hurts him he will lift up the left hand and arouse, whereas, although he may apparently have suffered, you will be surprised, when he arouses, to hear him declare that he felt it, but it didn't hurt, showing there was a good condition of anæsthesia present.

The use of suggestion in dentistry is not by any means limited to the induction of anæsthesia. It is well to remember that the average individual has five senses and that he reasons from the impressions received through those senses. A slight impression may give or take a patient—I mean such impressions as personal appearance, cleanliness of office and instruments, tobacco in any form, etc. How often one hears it said: "I know Dr. so-and-so is a good dentist, but then he takes his instrument out of a bunch and after using it on me throws it back again, I suppose to be used on some one else, without being washed, and then he comes right from the patient before me and puts his fingers in my mouth without washing his hands. I don't think I can stand him any longer."

How much better it would be if such a dentist, after seating his patient in the chair, would take pains to let his patient *hear* him wash and scrub his hands thoroughly or to let him *see* a clean set of instruments brought out, to *smell* that the dentist's breath is pure, and to *feel* very little of what is going on inside his mouth. This last result can be brought about rather readily by a little study of the senses.

I have so frequently had patients of mine ask me if I could not give them suggestions before they went to the dentist's and I have often done this. I give them some simple things to do which will divert the attention, and many of them have reported marvelous results.

This very afternoon a bright yet hypersensitive patient of mine asked me to give her some suggestions before she went to her dentist as she always had such a terrible time there.

She said that the last time she was at the dentist's he had a

rubber dam in her mouth and was working so long over a gold filling that for the time she was insane. She was conscious of nothing in the world but herself and her tooth: she felt that she would go wild unless something happened, and finally said to the dentist, "Doctor, talk to me or I shall go mad." The dentist at once became very indignant and said he was not a talking machine but a dentist, and had all he could do to attend to his work, and that any infant could stand what he was doing to her.

She afterward asked him if he would not hypnotize her. He once more became indignant and said that if she wanted any such tomfoolery she had better look elsewhere for it.

As a matter of fact, this woman is hypersensitive, is terribly afraid of a pin prick, is a physical coward and admits it.

Now, there are thousands of such individuals, and their teeth have to be filled and extracted as well as those who are fortunate enough not to be physical cowards. The dentist who knows how to make things easy for these individuals is the one who is going to receive their patronage.

Let us look for a moment at the condition of this patient. When she was in the dentist's chair, she was *hearing* nothing—I hope *smelling* nothing—she had her eyes closed, as nearly all patients do, and so was *seeing* nothing; in fact she was practically in the same condition as a hypnotic subject. That is, she had but one sense active, and as in the hypnotic subject, the whole attention was given up to the sense of hearing, so this hypersensitive patient's whole attention was riveted upon every impression received through the sense of the touch. Is it any wonder she became almost crazy?

We should remember that there is a law of nature called the law of compensation.

This law gives man a certain degree of attention which may be given wholly to one sense by shutting out impressions received through the others, or it may be distributed to several or all of them and to the degree in which it is developed in one it is lessened in another.

An infant may be suffering intense pain, but by clapping the hands in front of the little sufferer's eyes, so much of his attention is given to what he sees and hears that as long as these impressions occupy his attention he recognizes so little of what he is receiving through the sense of touch that he will laugh.

This sounds rather reasonable I think, but I assure you you will be much better satisfied of its practicability when you have gone deliberately to work to ease a patient's suffering by making use of his senses.

It is possible to keep them all employed, and it is necessary that there should be constant change. The child soon tires of the clapping and unless presented with a rattle or something else which will occupy his attention he soon starts again to cry.

Theoretically, a musical box or a brass band, a photographic panorama or a vitascope, a fountain of changing perfumes, and a cheerful conversationalist should be necessary adjuncts to a dentist's office.

Gentlemen, I am suggesting these few suggestions as suggestions of suggestions for suggestion.

A NEW METHOD OF BRIDGE WORK.*

BY F. EWING ROACH, D. D. S., CHICAGO, ILL.

A study of archeology teaches us that bridge work, in its various forms, has been in use for centuries. The Etrurians, who lived many centuries before Christ, were able to substitute lost teeth by fashioning gold into bridges, which were attached to remaining teeth. Other ancient specimens show different methods, such as carvings from ivory, and the teeth of animals attached with ligatures.

In the earlier methods, such as the stringing of ivory carvings on ligatures, there was little else than a substitution of a string of white forms which, at the best, could only have been intended for appearance. But the dentist of to-day is expected to reproduce Nature both in appearance and usefulness. It is not my purpose, however, to write the history of bridge work nor to make any pleas for its universal adoption, as a substitute for teeth that have fallen victims of the forceps, caries or have been otherwise destroyed. The advantages of a well-constructed and carefully adjusted bridge in judiciously selected cases can no longer be questioned.

Many cases present themselves that offer admirable opportunities for the conscientious operator, but its indiscriminate use cannot be too strongly condemned.

We have to-day to do with the best methods of constructing and adapting the substitutes for the lost organs, and my efforts in this paper will be given to a description of a method of construc-

*Read before the Chicago Dental Society.

tion. The ideal has not yet been reached. To my mind the porcelain bridge is nearer the ideal than any known method, but since it requires more skill to construct than the average dentist of to-day has, and the expense places it beyond the means of the majority of our patients, we must do the next best thing, and combine porcelain with gold to the best possible advantage.

A few years' experience and observation in soldering porcelain veneerings to crowns and bridges led me to believe that many failures were being made with this necessarily hazardous method, and caused me to look about for a safer way. I had not the good luck of "never having a checked veneering," as I have heard some say, nor had I the good fortune never to have a patient come back with the veneering dislodged; and while I had as little trouble along this line as the average, I was not satisfied. The objections to soldering direct to the porcelain are too well known to mention here, and will be brought out in the method which I presume to offer as a better one.

In presenting this method I do not claim any originality in the basic principles, but so far have been unable to find a similar method of making the attachments of the porcelain to the gold. Before going into detail of construction, will give what I believe to be the salient points of advantage as compared with other methods.

From an esthetic point of view it is second only to porcelain work as no gold need be exposed to view at any point. And no space is left between the anterior facings for expansion and contraction thereby obviating a dark line at this point.

In strength I claim that it is as strong, if not stronger, than any method where porcelain is used at all in the construction. The surface of metal resistance being greater than in cases where the solder is flowed directly on to the porcelain facing, and the porcelain is certainly stronger, not having been subjected to the fire at all. In cleanliness it meets the requirements admirably, since there is but little space between porcelain and metal and this space when case is complete is occupied with cement or gutta-percha, which prevents the ingress of the secretions of the mouth or any foreign matter whatever.

The points of advantage are its simplicity of construction, natural appearance, lingual contour, natural feeling in the mouth and ease of repair in case of accidents.

I need not dwell on the simplicity of construction as that is obvious to all at a glance and will be brought out fully in describ-

ing our method in detail. I wish to call especial attention to one point, which I think has been a great drawback to bridge work as it has been most commonly constructed. That is, the lingual contour. I have endeavored to overcome the deep pockets at gum contact and unnatural projections of the lingual cusps in molars and bicuspsids and the flat or slightly convex surface which narrows down to an acute angle at gum contact of anterior teeth instead of being wide at gum contact and slightly concave, tapering to the cutting edge. I consider the lingual contour of equal importance with the buccal or labial portion of a crown or bridge. It is of a most vital importance in the articulation of speech and as a source of comfort to the wearer. And last, but not of minor importance, however, is the question of repairs which must surely come to all of us in one form or another and most commonly in the form of a dislodged veneering, the replacement of which is made easy by having only to select the proper tooth and cement to place. In describing the method of construction, we will take a typical case



FIG. A, Nos. 1, 2, 3.

Fig. A, No. 1. Shows metal box-backing for short anterior teeth, with slot for horizontal pins. Longer teeth have pins vertical and slot in backing is made narrower and longer to accommodate the vertical position of pins, No. 2. Box-backing with lingual contoured portion bent over. No. 3. Cuspid crown finished.

from actual practice, give in detail each step in the construction of a bridge. The case in hand represents the superior arch with the six year molar on each side and the two centrals, right lateral and cuspid remaining.

The nerves having been removed and the roots properly filled, we will proceed to make the bridge. For the molars, if the bite is very short, would make gold cap crown, but in case at hand, will make porcelain crown with gold cup ballast without a band. The roots should be ground to a bevel from the center to the labial and lingual sides under the free margin of the gum, allowing the center to be the highest point.

Cut a piece of soft platinum thirty gauge a little larger than end of root and place over end of root and burnish down until

outline of root shows on metal. Trim to actual size of root as indicated. Sharpen a piece of wire to be used for post and force it through the metal into root canal, which can be easily located by pressing small ball burnisher over the center or about where you would guess the canal to be and a depression will occur just where canal is and just at this point the post wire must be forced through. Leave wire post projecting above metal on end of root so that it will come away firmly in place with the impression. This

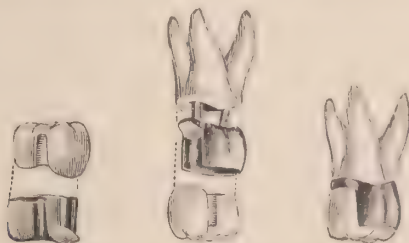


FIG. B, Nos. 1, 2, 3.

Fig. B, No. 1 Metal box-backing for molar (bicuspid the same) showing groove in side of tooth and depression in metal to correspond. No. 2 Molar crown ready to put together. No. 3. Molar crown finished.

much having been done to each of the roots, we will take the bite and impression, being careful to remove all the crown foundation with the impression in their proper position; get the model in the usual way, which brings out foundations ready for crowns to be

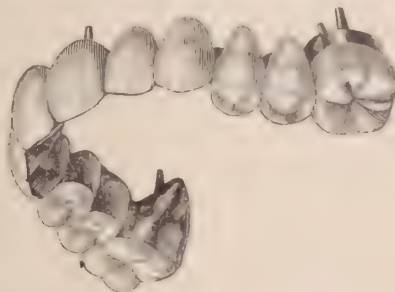


Fig C Represents finished bridge.

made. With a file or stone, cut off wire post flush with metal cap on root; select teeth with their proper box backing as near the proper length and width as possible to avoid too much grinding. Those to be used for the crown should be ground to accurately fit the metal foundations labially. The lingual V shaped gap between

foundations and box backing being filled with flux wax to hold parts together. The bicuspidis are ground to fit alveolar ridge and to proper occlusion and waxed to place in the same way: For the anterior teeth we have to first grind the porcelain to fit the ridge and then fit the box backing as follows: Place facing with pins into slots of backing and mark place to be trimmed at gum contact. Remove from facing and trim this portion before bending over contoured portion. Place back on facing, bend contoured portion over and burnish the two parts together; remove from facing and solder it. The box backings are then waxed with the facings in situ together on model in proper place. The porcelain facings are all removed leaving box backings in place ready for investment and final soldering.

In investing care must be taken to thoroughly fill pockets in the box backings to prevent solder from flowing into them. The box backings used in the crowns which form the abutments of the bridge should be contoured out full and round, which will make them solid and strong enough to support any size bridge.

With no porcelain in the case and platinum as a base to work upon, you can heat up and cool off quick as you like with no fear of burning holes in backings or checking porcelain. In bridges of large size I prefer to burnish a piece of platinum to alveolar ridge between abutments, wax dummies to this and fill in with solder, which gives the same results as in porcelain work.

I use the porcelain and backings in making single crowns both in anterior and posterior teeth and obtain a good, strong crown, which has no metal exposed to view. In making gold plates, they are equally useful. In fact, all cases where a combination of porcelain and metal is desired, they may be used to an advantage.

IMPROVED PORCELAIN CROWNS.

BY NEWTON W. HIATT, D. D. S., MARION, IND.

I presume there is not a dentist in practice for any length of time but that has had some trouble with Logan crowns and the other various makes of porcelain crowns. In some the post is not strong enough and either breaks or bends.

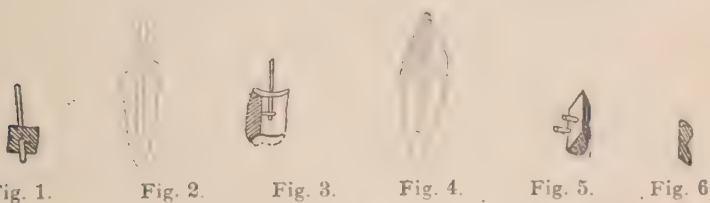
The crowns I wish to illustrate to you are to overcome, first, the strength of post; second, a perfect adaption to root, and third, greater ease in adjusting it to proper articulation.

We will take first the superior central, the root being prepared almost the same as for a Logan crown.

The root reamed out to admit of a strong post of irido platinum wire. Insert the wire and mark the depth of root cavity. Remove wire and take a small piece of platinum plate thirty gauge, large enough to cover the root; punch a hole in the center and fit closely over post and down to the mark made on wire. Hold at this point and solder with pure gold. Fig. 1 shows the post and plate ready to adjust to root.

Now by placing this on root and gently pressing edges of plate down to root it is a very easy matter to dress the platinum disk to the contour of the root.

When the disk is properly adjusted to root the irido-platinum wire may be cut off but not close to disk as you will see by Fig. 1. After post is cut to proper length it can be placed back on root and



is ready for the adjustment of the porcelain facing. Fig. 2 shows the post and disk and its relation to root, while Fig. 3 shows the facing with the pins occupying the position necessary to adjust to the post.

The facing is ground to fit as closely as possible to the disk. Sometimes it is necessary to take a thin edged wheel and cut a groove in the back of the facing. This allows the facing to set in farther by allowing the post to come into the groove.

After the facing is adjusted it may be fastened by bending pins down on post, and if careful in handling may avoid soldering. The crown is now ready to bake. It usually requires but two bakings to complete. I use Downie's porcelain body for all crown work.

After first baking if the ends of the posts or the pins in the facing extend out so far as to interfere with the contour they may be ground down without harm to crown. They have served their purpose and cause no weakening of crown by cutting them down.

Fig. 4 shows the crown complete and the relation of the new porcelain to pins and post.

For the bicuspid the first steps are the same as for the central. After the disk is adjusted it is necessary to take an impression and bite and mount on crown articulator. Select a cuspid facing and adjust as with the central.

The cutting edge should be tapered slightly so as to adjust metal cusp. The cusp may be made from either platinized gold or by swedging a cusp of pure gold, then one of platinum inside the gold. Put the two together and with blowpipe heat to sufficient heat to fasten together. The platinum furnishes a base for the gold; even though it should melt while baking it will hold its place.

The cusp should be trimmed to fit to the facing where facing. was beveled so that but very little of the metal shows.

This cusp should not be adjusted until the second baking when it can be held in position by using thick mixture of porcelain and adjusting crown on model. Figs. 5 and 6 show the cusp as it should be cut, and the crown complete.

Two posts may be adjusted to the bicuspid where necessary. The metal cusp protects the porcelain and makes a very serviceable crown. The same crown may be made by making a metal cap for root instead of disk, but I prefer the disk as there is no metal to be seen and nothing under the margin of the gum to irritate it.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held in the rooms of the Chicago Medical Society, Stewart Building, November 2, 1897, the President, Dr. A. H. Peck, in the chair.

Dr. F. Ewing Roach read a paper entitled "A New Method of Bridge Work," with practical illustrations.

Dr. A. W. McCANDLESS, in opening the discussion, said: I have had the pleasure of examining some crowns and bridges constructed by Dr. Roach and I must say that he has evolved something that has natural appearance and unusual strength to commend it. No piece of mechanism is stronger than its weakest

point, and the weak point in bridge work heretofore has been the facings or veneers. In this method the facings are not exposed to heat and therefore are not weakened or checked, or discolored as is so often the case in soldering.

In view of these objections I have not soldered a facing in years. I have made crowns and bridges by a somewhat similar process to the one brought to your attention this evening, by using the so-called diatoric teeth and making a matrix or box of gold for each tooth, and in case of a bridge, uniting these matrices in the manner suggested by the paper. Of course, the diatoric cuspids and incisors could not be used in this way, and for those I have employed the ordinary facing, and have avoided soldering those by uniting the pins of the veneers to the previously prepared backings. Dr. Roach's method of mounting the anterior teeth I deem a decided improvement over the one I have used.

I cannot agree with the essayist on fitting caps to the ends of the roots of teeth without the band to encircle and bind those roots.

Thirty four gauge platinum, I concede, is very easily burished to the end of a root, but in the soldering process of joining the box that shall receive the porcelain veneer, to this platinum cap, there is a strong tendency for such a thin piece of metal to draw, and the perfect adaptation of that platinum to the end of the root is no longer possible. Neither will there be as much strength in such an abutment as if a band surrounded the root. It will not be as cleanly, and the exposure to the fluids of the mouth adds another objection.

Now a word as to porcelain crown and bridge work.

Let me quote from the paper: "To my mind the porcelain bridge is nearer the ideal than any known method, but since it requires more skill to construct than the average dentist of to-day has, and the expense places it beyond the means of the majority of our patients, we must do the next best thing and combine porcelain with gold to the best possible advantage."

If porcelain is the correct, the best and the most artistic, then porcelain is the thing to make. If a patient cannot afford the extra expense of porcelain, make it for the same price you would obtain for the other. Two results are thereby obtained. Your patient is better served, and you gain in experience. Your experience secures to you better results and more artistic effects in each

succeeding case. I would rather make a porcelain bridge than one such as the essayist has described, because, aside from the other reasons mentioned, it would be easier for me to construct.

Porcelain crown and bridge work is still in its swaddling clothes. We have much to learn. I have had a number of failures, but I can attribute each failure to some error of my own, to faulty construction somewhere. I am trying to learn by these mistakes to arrive at something absolutely good, useful, durable.

My advice to all earnest crown and bridge workers is that if you would keep up with the procession you must take up porcelain crown and bridge work. If sometimes your work fails, don't blame the system. If you are unsuccessful in producing satisfactory effects and an artistic appearance, do not be discouraged. If a bridge comes back broken, do not say I have lost confidence.

A dentist who had seen two of my gold bridges with porcelain facings and a bridge made of porcelain all in one mouth, said to me, "Your porcelain bridge, from an artistic standpoint, is inferior to the others." "My dear boy," I replied, "that is the first porcelain bridge I ever made. It took me fifteen years to learn to make the others, do you not believe that in fifteen years I shall be able to produce something in porcelain that will excel that?" So I say, get into the band wagon, boys, and if you have not begun porcelain work, start in to-morrow; then when we shall have reached the pinnacle you will all be with us. Porcelain has come to stay. The sooner you get at it the more quickly you will become proficient in it. How else can you become skillful in this work? When the subject of bridge work began to be agitated several years ago, I was opposed to it. With many other deluded ones, I condemned bridge work. However, I shortly discovered that it was a good thing, and that if I was to be considered progressive I must take it up. I now regard porcelain bridge work just as I did the gold bridge work fifteen years ago, that if I wish to keep in line I must perfect myself in porcelain crown and bridge work.

Dr. B. J. CIGRAND: I was very much pleased to hear something along the lines of prosthetic dentistry. It is rather a lamentable fact that whenever a subject of this kind is brought before the societies there is usually a thinning out of the audience. It seems to me, if the dental profession is interested in practice, it surely ought to take great interest in the subject of dental prosthesis.

Theory in dentistry is only good in so far as it helps in actual practice. Where I have success in operative dentistry marked a hundred, I find with the same effort in prosthetic dentistry it is only marked seventy-five. I believe that the dental profession, if it is lame in any one particular direction, it is in prosthetic dentistry. I further believe that where there are a hundred men who can fill teeth properly there are not fifty who can make an ordinary telescope crown according to physiological and hygienic laws. For that reason I am ever prepared to encourage attempts along prosthetic lines; I am very glad to see that the members have remained to hear what Dr. Roach had to say along practical lines. Some of the ideas he advances are new but as he says in his paper the basic principles are old. We know by experience that very few of the things that we have can be called recent—the principles underlying nearly all inventions are ancient—we may modify and improve an appliance yet not change the principle. We may slightly change the principle, and after all these variations, not change the ruling factor. Dr. Roach was modest enough to admit that the bridge he presents this evening is not an original idea of his; that the basic principle is not original with him, but the variation of the principle is original. These admissions entitle him to our earnest attention, as they show honesty of purpose.

There are a few points with reference to the bridge that have been commented on very highly by Dr. McCandless, and since this has been done I do not wish to take up further time in recommending; but I would like to say a word in the way of criticism, and just criticism hurts no man. The criticism I would make is this: In the first place, I find in the specimen bridge case which has been passed around that he has apparently a weak shell root of a cuspid, and there is no band about it. There is also no band on the molar. To band or not to band, that is the question. It is a question that puzzles me, and I have asked the same question of others who are earnest in prosthetic dentistry. Shall we, or shall we not band the root? Unless the root is banded properly, and we are conscientious in trimming down the edges of the root in order to have them parallel, the banding will result in failure. As certain as we overlook this truth, we will meet pathogenic organizations whose presence invite an "inevitable destruction." Spend as much time in studying what construction of denture will best suit the case as you do trimming the root; have a clear con-

ception of what you intend to perform; shaping the edges and margins of the root should require at least as much time as to construct the crown or bridge. It takes pretty nearly that much time. One-third of time for decision of construction, one-third for preparation of root, one-third for production of appliance.

If there is any particular instrument suitable for shaping roots at the present time, it is one that will trim down the roots so that the sides are parallel. I have a number of these instruments, but not one of them meets my ideality of the subject. There is room, therefore, for an instrument by which we can trim down the sides of the root so that they are parallel. The Ottolengui trimmers look good on paper, but when you use them in actual practice it is a different thing altogether. You will find that these reamers or facers, as he calls them, will destroy more teeth than they will save. I have found this true when I have used good, sharp and new instruments from the depot. There is great need of a root trimming instrument. Unless the band is fitted properly it is going to be more ruinous than useful. One advantage in using a bridge without bands is that it preserves the gum margin, for if in any way the bridge interferes with the interproximal space or gum margin it will invite more or less injurious results.

Another point is this: I question the advisability of resting the intra-bridge firmly on the alveolar ridge. It would seem to me that food would get under it, and putting on a nonremovable bridge it would naturally follow that debris would collect under this inner saddle of the bridge and eventually assist in destroying the teeth. I may be mistaken about this, but it is my firm opinion. This bridge is an excellent one, but I think it would be much more effective if it were made in the form of a removable bridge, so that you may take it off and clean out the alveolar space. Otherwise the doctor ought to be complimented on his very excellent paper. There should be greater encouragement to do more in the line of prosthetic dentistry; there ought to be a wholesale revival of the subject. We are weak in prosthetic dentistry. If the dental profession wants to advance in actuality and not in name alone, we should not be afraid to get into the laboratory and work. We will find men in the dental profession who will go with us in our offices and talk about the theories of dentistry, but just as soon as we open the laboratory door you have initiated them into a department of dentistry which has no attraction, and they will

stop. They will go no farther. I believe that the reason for this noninterest can be traced to an unacquaintance with the necessary knowledge of practical prosthesis. I hold that the proper place for the future dentist is in an equipped laboratory: actual acquaintance with the dental laboratory will yield much good. It is unnecessary to portray such a laboratory as being disfigured by hieroglyphics of plaster of Paris. It should be a choice room, filled with light and complete in every detail. The first lessons I received along this line were when I visited Dr. McKellops, of St. Louis, in 1892. I was unknowingly in his laboratory, conversing with him half an hour, when I asked permission to see his laboratory. He seemed much amused, and he said to me, "This is my laboratory." It was a parlor. If the future dentists are interested in the general welfare of actual practice and not alone in theory, they must make the laboratory a more inviting spot.

Dr. Roach, in closing the discussion, said: The hour is late and I shall spend very little time in further discussion of this subject. I wish to refer to one or two points touched upon by Dr. McCandless and Dr. Cigrand. Both of them spoke of the band. I do not claim to put on all my bridges or crowns without a band, but experience and practice have taught me that I can adjust crowns and bridges, even Logan crowns, and not band them, where the strain is not too great on them, by the bevel method, making a perfect continuity of crown with the root, after fitting it approximately, by placing warmed gutta-percha between crown and end of root, force crown to place, or move again and trim off gutta-percha to outline of root as indicated. This makes a perfect adaptation of crown to root and an indestructible joint. This I did with the anterior teeth in the case I exhibited this evening, banding the molars, but I would not have done it had they not been so elongated that I would have endangered the bifurcation by grinding down in order to reach the point I desired.

It is unnecessary to band the roots where a bridge extends from one side of arch to the other, because you have resistance from the opposing sides which is sufficient and if the teeth are properly beveled and crown accurately fitted there is no possible chance for the root to split.

In regard to the saddle on the bridge, I want to offer an apology for the specimen shown. It was gotten up hurriedly and just set on to a piece of plaster to show the work and not so much the

adaptation. The saddle is larger than I would use in a practical case. It is made so narrow that there is no chance for food to accumulate between it and the gum. This bridge constructed with the saddle gives the same results in porcelain work. If porcelain work is ideal, why can we not construct something similar to it and obtain the same results with much less labor and in a great deal less time? The question of bands and saddles may be settled by each operator to suit his individual opinion and has no relation to the part of the work which I have tried to emphasize namely the attachment of porcelain to metal.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

Regular monthly meeting held November 8, 1897, with the President, Dr. Geo. B. Perry, in the chair.

Dr. Herbert A. Parkyn read a paper on "Suggestion and its Application to Dentistry."

DISCUSSION.

The discussion was opened by Dr. E. L. Clifford. He said : I regret the absence of the member selected to open this discussion. For a long time I have thought a good deal about hypnosis, but according to the doctor's paper I have thought erroneously. Many questions have bothered me in thinking about true hypnosis, but now I am sure they will be clearer to me in the future. I thought that hypnosis meant sleep. This, of course, shows my ignorance. I thought the dentist must be able to destroy the consciousness of his patients. A great many patients have the idea that hypnosis takes away their consciousness. They believe that they are not cognizant of anything that is going on around them. If the public can be educated as well as dentists that hypnosis is not a state of unconsciousness, not a state of sleep, and that they are responsible for their acts, I believe that we will open up a field that has been almost useless to us in the past. It is hardly necessary before this society to take time to say anything regarding the value of suggestion to our patients. We know that every dentist has a certain amount of control over his patients. There is a magnetic influence between every two persons. All of us exercise an influence for good or evil with every person we come in contact with. We often know when a patient

gets into our operating chair, before we do anything to him or her, as the case may be, whether we are going to have a pleasant or unpleasant sitting. We are not able to satisfy some patients, no matter what we do for them. On the other hand, we know when we are going to have an easy time. I try to gain the confidence of my patient, and having done this they begin to believe that I understand my business. We may speak of it as two similars acting pleasantly together. At any rate, the potentiality between the two parties is as it should be. As dentists, we now and then encounter patients upon whom we dread to work. We do not feel this dread because the operation itself is so difficult, for we have performed much more difficult operations for other patients with greater satisfaction to them and ourselves. But, as I say, in the case of some of our patients we cannot get the correct status between the patient and ourselves. It strikes me, according to the paper, it is a matter of education in this point. In the first place, the dentist or operator must be educated. Suggestion or hypnosis is a dangerous thing to use unless we know what we are using. The same applies to the use of chloroform, ether, or any other anæsthetic agent, and in the use of them a little learning is a dangerous thing. It seems to me, it would not be just the thing to admit that we operate upon our ignorant patients by means of suggestion, and in this regard we have a duty to perform with our patients, to educate them in the matter of hypnosis or suggestion, so that we can get the best results out of the agent that we are using. There is not one of us who would attempt to use any one of the agents in our materia medica without first thoroughly understanding the pathological lesion or condition to which we apply that agent and then the agent itself. I do not believe suggestion is a thing that anybody can use at random. I have used suggestive therapeutics unconsciously and ignorantly in the past, and I feel I would like to know more about the subject.

Dr. C. E. BENTLEY: I do not know very much about this subject, and I know less about it than when I came in, for the doctor's paper has confused me. However, the paper was an excellent one particularly that part of it that applies to us as dentists. I had hoped that he would say something on the philosophy of so called therapeutic suggestion. According to the doctor's method of inducing hypnosis and those with whom I come

in contact, who claim to know something about this matter, there is a wide difference. It has been my privilege recently to attend several clinics given by a psychological school for therapeutic suggestion in this city, and the *modus operandi* of inducing hypnosis so-called is entirely different from that described by the essayist. However, the technique advanced by the essayist seems to be a rational one, and his paper certainly gives me a greater insight into the subject than I had before. I must confess, however, I have been skeptical as to the effects claimed to have been produced by the technique that I have been fortunate enough to witness. Not many months ago I took a course of lectures on this subject for the purpose of aiding me in my practice, to alleviate pain which I am compelled to inflict upon my patients in performing certain dental operations; and the technique that was taught me there is different from that advanced in the paper. I do not consciously use hypnotic suggestion, therapeutic suggestion or psycho-suggestion very much any more. I have never used it very extensively. As the preceding speaker has said we all use suggestion more or less unconsciously, a great deal more than we are aware of, and I am on record as having made the assertion at one time that in proportion as a man uses suggestion unconsciously successfully, just in proportion is he a successful professional dentist. I said that I do not use it much any more, and the warning note was sounded by the essayist who related the experience of a dentist who was practicing suggestion upon some of his patients. I will tell you what I think about the matter. It is well enough to use every possible means for the alleviation or amelioration of pain that we know anything about, but as indicated in the beginning of my remarks, the hypnotists, psycho-therapists, or the suggestionists seem to be at war with themselves, and I do not consider it wise that we should use so powerful a force until the psychologists are agreed upon some standard of administration and more is known of this force from a scientific standpoint. Whether we will get out of the psychological laboratories that are at work all over the world to-day a definite something that can be proven, I am not able at present to say. Suffice it to say that I do care to use suggestion. Psychologists are a unit in their agreement. I do not care to use suggestion ignorantly, for I think, as the essayist has indicated, it is a dangerous thing in the hands of ignorant men. I do not care to use it for the reason

that it militates against my practice. I have several instances in mind that bear strongly on this point. I had a lady, an intelligent woman, for a patient. Soon after taking my course in suggestive therapeutics, hypnosis was uppermost in my mind, and when this patient came to me I commenced fixation of the attention. I tried to fix her attention as best I could on a string that hangs pendant to one of the curtains in my office by excluding all other sensations. I did it in a very circuitous way. And she said to me, "Doctor, that is hypnotism." I said to her, "You may call it what you please Miss A., but that is what I want you to do in order to alleviate the pain incident to the operation." She then said, "I have been looking into this subject myself." I replied, "Have you? then you can aid me all the more." She was a ripe subject and looked at the matter intelligently from a psychological standpoint. She fixed her attention to the best of her ability. She has been my patient for five years, and I never operated on her with less pain than at that time. She sent two other lady patients to me last summer without mentioning anything about the successful sitting she had had, and these ladies expressed themselves as pleased with my service, saying that they had not suffered as much as usual during dental operations. She said to them, "Did he use hypnotism on you?" "Why, can he do that? Well, if I thought he could do that I should never have gone to him." Miss A. came and told me about this matter. We must look out for these things in looking at the financial aspect of our practice. There are certain people who will not permit themselves to surrender what they conceive to be their consciousness, if it is known, and I do not know whether hypnotism is yet a safe thing for us to take up other than along the line indicated by the essayist in the latter part of his paper. The suggestiveness that comes to the patient and the confidence that comes to both patient and operator by our personal bearing, cleanliness, lack of odor of cigars, odor from the body, general demeanor toward patients, are the essentials to any man who has got the dignity to practice dentistry. The induction of a hypnotic condition, or the induction of an influence peculiar to occultism, is something I am afraid of individually, and I do not know whether it is best for the dental profession at large to take up the idea of therapeutic suggestion along these lines.

Dr. J. H. WOOLLEY: I think the subject under consideration

is an exceedingly interesting one. We know very little about it, but it seems to me that a great many of us are using hypnotic suggestion in our practice unconsciously. I speak of suggestion of many kinds which is possibly akin to hypnosis or hypnotic suggestion. For instance, the president of this society, Dr. Perry, has a great many followers, who like to put their hand in his and shake it. He seems to have something about him that is suggestive of human sympathy. A great many people exert an unconscious influence over others to a certain degree. Let us take a few people that have gathered together. At first, there seems to be an antagonism, yet in a little while an agreeable feeling manifests itself, and they become intimate with one another. As has been clearly shown by the author of this paper, it is not so much impressing the idea on a patient that he is going to be hypnotized, but it is the new condition that is being brought about that is going to change the current of thought from the idea of pain, but the passing of the thought to another subject. I would like to give a little experience that will make a little clearer to you what seems to me was an unconscious suggestive power that I had that helped me in my practice. In the first few years of my practice in my operating room I was nervous. I did not have confidence in myself. I feared to inflict pain. I feared that I could not handle an instrument as successfully as I should. I disciplined myself to perfect composure, to repose. I tried to have everything around me in my operating room in an orderly manner and everything clean, and the idea was to have it, as it were, the holy of holies, and then when I approached my patient, not to say that this operation is going to be very painful, but I gave the patient the impression that the operation could be lessened, as far as pain was concerned, by the handling of the instruments; that the instrument itself by rough usage on part of the operator could cause pain. I tried to explain the manner of using the instrument to the patient, and that while the instrument might cause more or less pain, possibly there was no pain in the tooth itself. By degrees there was an influence exerted over patients that put them in a condition of mind so that they had absolute confidence in me; and by operating carefully and getting their attention off of the operation at the time, they seemed to pass in a quiet restful state, and after the operation was over many of them exclaimed, "Why, that operation was not severe as I had supposed." It seems to me,

therefore, that we are all using unknowingly to ourselves auto-suggestion.

I recollect an incident which set me to thinking. It was an actual occurrence in my office, and I could not understand it. It was marvelous to me. I was operating on a lady who was of a highly sensitive organization, and she seemed to be suffering intense pain when I was preparing the cavity previous to filling it. I stopped for a moment and gave her to understand that she should rest, and let everything of the operation pass out of her thoughts. When I got behind the chair to fill the tooth, although I was not ready to proceed, I had a feeling in my heart, and I said to myself with great energy, I wish there was something to relieve that pain without anæsthesia. She did not discover my feeling, but when I expressed that wish she ceased the motions of her feet, and I operated on her eventually without any pain. I could not account for the philosophy of suggestion in that case. I do not know anything about it, but it set me to thinking. I think we can use suggestion toward our patients in many ways that they are unconscious of, and I have no doubt there are many practitioners who do that.

In some way dentists divert the thoughts of their patients, and the patients have no idea that we are going to place them under the influence of suggestion or in a somnambuistic state. There is a way of approaching a patient without his knowing what we are doing, and I hope Dr. Parkyn, if he has time will elaborate this phase of the subject in his closing remarks. If I tell my patients that suggestion is a boon to humanity and a boon to them, I am afraid of driving them away. If my patients want to be relieved of pain I am going to relieve them the best way I can.

DR. E. MAWHINNEY: I am like Dr. Bentley, I do not know anything about hypnotism. I have tried somewhat to look into it, and with Dr. Clifford, I am quite at sea. There are a few things I do know regarding the power of suggestion. These I know from experience. I may say, in the first place, that after a patient has once been taught the art of inducing the hypnotic condition he or she is easy to work upon. I recall a patient that has been coming to me for eight years, and within the last two years she has been under the treatment of Dr. Parkyn, who has treated her by means of suggestive therapeutics. She suffered so that she was a difficult patient to work upon, and all these years I have dreaded the

time when it became necessary for her to come to see me. Her teeth were unusually sensitive. She suffered intensely at each sitting, so that it was absolutely impossible for me to do perfect work. I have spent hours in thinking of what I could do for her to help her out of this trying ordeal. I have exhausted myself in working on her teeth, and she would be so completely exhausted at the end of a sitting that she would have to remain in bed for two or three days thereafter. When she came to me, after being under Dr. Parkyn's care, she said, "The next time I come to you to have dental work done you must hypnotize me." I said, "All right." I had been studying hypnotism a little, but hardly knew how to go about it. She came into my office, although she had not seen Dr. Parkyn for two or three months prior to this time, and believe me, gentlemen, she sat in my operating chair, fixed her eyes on the electric reflector above and immediately subdued herself, so that she was absolutely quiet and peaceful. Her whole nervous system was at rest. I worked for her without her manifesting the least sign of pain, and yet she would talk to me and I would talk to her. After I got through I said, "This time you will not have to go to bed; there will be no aftereffects, and you will feel as though you had a restful time instead of a period of high nervous tension." So from that time I have not had any trouble with this lady. I believe she would go into an active somnambulistic state without any assistance from any one.

I have had the pleasure of seeing my fellow practitioners operate with the use of suggestion, and some of them go about it in a way that does not seem to me to do much good. About six months ago I was in a brother practitioner's office and my attention was called to what he was doing and the manner in which he was making suggestions to the patient. They were anything but suggestions. The perspiration was running off his nose and chin and he was shaking all over. He was determined to force suggestions into the patient. For years I believe I have aided my patients in this way. In the first place I have no display of anything in my office. My instruments are all covered up. I take the instrument I want to use, and after I am through with it my assistant takes it away. I have but two or three instruments in sight at a time. I also try to have as little machinery and noise as possible.

Another thing I have noticed is this, that when a patient goes

to have a tooth extracted, some of my fellow practitioners say to him, "It will hurt a little, just nerve yourself up to it. It will only be for a minute." The patient then takes hold of the arm of the chair, stiffens himself up in the most rigid way, and the process of extraction hurts him terribly. I do not extract teeth in that way. Whenever a patient sits in my operating chair, plants his heels down and holds himself in a rigid way, I tell him, or her as the case may be, to wait a minute until he gets over the nervous excitement. I tell my patients that there is nothing to be very nervous about. I tell them that when the nervous system is put in such a state of tension the nerves act like telegraph wires, they concentrate on everything I am doing, and the whole nerve force is directed in that direction, telegraphing the sense of touch and the sense of pain to the brain. I urge my patients to relax their muscles as much as possible and feel at ease, and when they do this they do not scream with pain. I think those of you who perhaps have gotten some of my old patients have been told that they did not suffer much in my hands. I have never told a patient that I was going to hypnotize him, for I cannot, but I can suggest these things, and personally I find it of great advantage to myself. Since I have been a dentist I have always had one dentist to look after my mouth. I have a great deal of confidence in his ability.

When I first went to him I suffered a good deal; I used to perspire freely during a dental operation. At his suggestion I began to practice suggestion on myself. This I have done, and I am now able to sit in a chair with my muscular system perfectly relaxed and suffer very little pain. He talks to me. I try to fix my mind on something different from what he is doing. Perhaps I fix my mind on a book I have just read. I do not suffer the tenth part of the pain that I did a few years ago when the same dentist worked for me. You may call it suggestion or hypnotism, but I call it **power to control and relax one's self.**

Dr. DON M. GALLIE: If I understood Dr. Parkyn correctly he spoke of hypnotism and christian science as being entirely different. I would like to ask him if there is not some relation between suggestive therapeutics and christian science. And in this connection I wish to speak of an intelligent lady patient of mine. Six years ago she was extremely nervous and sensitive, so much so that it was almost impossible to do good dental work for her. Since then she has become a convert to christian science and she

is a firm, honest and sincere believer in it. She comes to me about once in six months to have work done. At her last visit to my office I had a bad cavity to fill, the decay having encroached upon the pulp. I worked around in that cavity very freely and she did not seem to suffer a particle.

After I had completed the filling she told me that she was a believer in christian science. I asked her why she did not make any demonstration of suffering during the operation, and she replied that she was determined to remain quiet while in the operating chair, and her belief was sufficiently strong to apply it to a dental operation, and she declared that she did not suffer a particle of pain. She claims that she treats all the ills that human flesh is heir to and is raising her children according to the laws laid down by the christian science.

Dr. C. E. BENTLEY: Is it true that pain is not a condition *per se*, but the mental perception of an injury? I would like Dr. Parkyn to answer this question in his final remarks.

Dr. H. H. WILSON: I understand from the doctor's paper, that he never puts a person in a hypnotic state or offers hypnotic suggestion without his consent. If that is true, I want to know if we are practicing hypnotic therapeutics when we are simply telling our patients that an operation is not going to hurt them, and that they must be calm. Again, is it proper to induce this condition without first obtaining the consent of the patient?

Dr. A. H. MURDOW: I am not a hypnotist or suggestionist, but I want to thank Dr. Parkyn for his able paper. I have thought a great deal upon this subject. I cannot agree with some of the remarks that have been made. I agree more with the essayist. I do not believe there is anybody but what can receive or is susceptible of suggestion. I do not believe there is any one but what can suggest. I would like to see a person that is not capable of receiving suggestion, or a person that cannot suggest. We know that there are men in business every day who make their fortunes by suggestions. Suggestion is abroad in the land, and there is no patient that we cannot influence to a greater or less degree. This is an indisputable fact.

Dr. GEORGE B. PERRY: I want to express appreciation in behalf of the Odontographic Society to Dr. Parkyn for giving us such an interesting paper. Speaking as a dental practitioner, it seems to me the influence one has over his patients is well worthy

of consideration. The condition of relaxation, both to the operator and patient, is very essential. While the operator keeps himself in that condition apparently he may yet have a firm hold upon himself, but a quiet manner of controlling his patient. It is as necessary, in my opinion, in many cases for the dentist to hypnotize himself as it is to hypnotize the patient. If an operator has had an unusually hard day in working upon nervous patients his condition is clearly shown in his personality, and if he has not his personality under control the patient is sensitive to and affected by it.

One of the most important factors in auto- or psycho suggestion, or suggestive therapeutics, is that of temperament. Temperament seems to be the fundamental principle in the success of the dentists' practice. The more nervous a person is the more readily he takes suggestion; and while we may feel that we have a patient under our care upon whom we cannot operate, yet by quiet, firm suggestion we may get him under control more readily than it would otherwise seem possible.

When in the Auditorium building I had a patient who was known as a Christ scientist. The distinction between a Christ scientist and a christian scientist, according to her explanation, being a christian scientist does not believe that pain exists, it is a negative condition. On the other hand, a Christ scientist admits the possibility of pain, but he can control it by effort on his part. This patient came to my office accompanied by her husband, who is a lecturer on this subject. She is a teacher of this doctrine. He was also the editor of a paper, the name of which I have forgotten. She had a left lower second molar which was elongated from pericementitis and very painful. Being on the same floor with them, I was familiar with her name and occupation, and I thought it an excellent opportunity for me to test how far her faith would go in connection with the work I was to do for her. I used a pair of ordinary pliers on the tooth, pressing down fairly hard and immediately she winced. She said that she felt a little uncomfortable. Her husband standing in front of the chair suggested that the tooth did not feel uncomfortable, and there was no sensation there. She opened her mouth and I repeated it with the same result. Her husband said to her, "What are you moving about for? There is no sensation there, why do you move?" But she said she felt uncomfortable, although there was no pain. I

said, "What other name do you call it?" I then asked her what she wanted done. She said she came to have me look at her tooth and to treat it, as she had been so busy with hopeless cases given up by physicians she had not had time to attend to herself. I then said, "There is a possibility of pathological conditions getting beyond your control." "Oh no, not at all," she replied. "How about this case? What do you expect me to do?" She said, "You might give me a little relief." I replied, "If I do it will not be according to your ideas. The tooth needs treatment at once if you do not expect to lose it." During the conversation I elicited from her that she filled her own teeth. This was a new idea to me. I said, "Will you kindly tell me how you perform this operation and by what means?" She replied, "I simply will that the tooth be filled." I said, "With food?" She answered, "Not at all." I said to her, "Let me ask you a practical question. Did you will the tooth to be filled with the same constructive material with which the tooth was composed? If so, will you kindly point out a tooth filled in that manner?" She put her finger on a left upper second molar. The tooth was filled as far as it could be on account of occlusion with calculus. I said, "It may be rather strange to you, but you will pardon me if I say it is in a filthy abnormal condition and decidedly unnatural, and the only treatment for that tooth is to remove the deposit." I took a mouth mirror and showed her how it could be broken away from the tooth structure and the clear natural lines of the tooth shown. Her husband went so far in speaking of the reconstructive tissue of the body, as to say, there was as much of it in the body now as at any time. I asked him whether he realized what he meant by that statement, and said, to him, "Do you reason on the basis that if a man lost a leg, the reconstructive tissue of the body would grow another one just the same?" I advised him not to waste much time over this as he would not be successful.

Dr. Parkyn, in speaking of the tests of the condition of suggestive therapeutics, referred to the use of a pin. He did not speak of disinfection. I remember one man who would hypnotize himself, then run a needle through his tongue. He did it several times. He would take a knitting needle and let any one in the audience handle it. It is a dangerous thing to use a needle in such a manner as that. A steel pin is best used in such demonstra-

tions, but whatever is made use of should be thoroughly disinfectcd.

People speak of the condition of hypnosis as varying from a light sleep to catalepsy. I have assisted during surgical operations in what is called hypnotism that have been performed with little or no sensation of pain.

I agree with the other speakers, that Dr. Parkyn has very much simplified our understanding of auto-suggestion. He has given it to us in a clearer and more tangible manner than I have heard before, and it appeals to me as practical if one feels like using it in his practice.

I want to express the necessity of dentists being *en rapport* with their patients. If this is done, I am sure suggestion would be followed by beneficial results.

A MEMBER: I would like to know how the case of the Christ scientist eventually turned out.

Dr. PERRY: She came in four times to have the tooth treated. The last time she came in with her husband, the inflammation of the tooth had subsided considerably, and it had gotten back into position so that it occluded quite naturally. Just as she was getting out of the chair, she looked up at me in an energetic sort of way and said, "I do not think I will come to you again. I can handle the tooth now myself." I bade her good morning, but collected my fee.

Dr. PARKYN, in closing the discussion, said: I desire to thank the members of the society for the kind way in which they have received my paper this evening, and I shall endeavor to reply to the questions that have been asked.

To obtain a thorough knowledge of suggestion one should first study theoretical and practical psychology.

When this has been accomplished the explanations of vexing questions and perplexing phenomena, and the application of suggestion will be found to be very simple and satisfactory.

Suggestion is built on common sense principles from the bottom to the top. There is nothing mysterious or uncanny about it. There is nothing about it that cannot be satisfactorily explained; in fact we might go so far as to call it an exact science.

You will find that the "suggestive state" is the result of certain conditions which are easily brought into activity in every one

when the operator understands the physiology as well as the psychology of the condition.

One gentleman described the difficulty experienced in handling a patient who insisted on contracting his muscles when in the chair, and the marked difference produced when he persuaded the patient to relax.

The explanation for the change is simple. With the general contraction of the muscles comes a great increase in the amount of blood in the head. In this state sensation in the head is increased, as well as any pain resulting from inflammation. Add to these conditions a patient's concentrated attention and fear of pain and the hypersensitive condition is accounted for.

In such a condition a patient is "en rapport" with his sensation and is not amenable to suggestions of anæsthesia until complete muscular relaxation is procured.

There are two methods of inducing anæsthesia. First, by producing a condition of concentration. Secondly by diverting the attention to impressions received through the other senses. The first method is best adapted to those who are not physical cowards "at heart." The second may be used in every case, but it is most happy in its effects upon hypersensitives, for when properly used it greatly reduces their suffering and nervousness.

Anæsthesia does not depend upon deep suggestibility but upon a certain preconceived interpretation of pain, coupled either with an ability to concentrate the attention or with a great lack of voluntary attention on the part of the patient.

One is in a state of suggestibility or receptivity the instant the eyes are closed, and suggestions have exaggerated effects, the exaggeration being limited by the auto-suggestion of the subject.

I may stand one man on his feet with his eyes closed and tell him I am drawing him backward, and he falls backward, although the very tone of the positive suggestions I gave would arouse the antagonism of another. Such a man is generally accustomed to obey; not to command; his head work is generally done by another and he has little determination or originality.

Again, take the greatest skeptic you can find, all the better if he is domineering and full of argument, give him a few simple, practical examples of the effect of the mind upon the functions, such as the mention or sight of a delicacy upon the saliva, the effect of a bad odor or sight upon digestion, etc. When you have

pointed these facts out you have started him to thinking seriously. Ask him then to stand with his eyes closed and to concentrate his attention upon the sensation of falling backward, and if he is honest he will surely bend or stumble backward. You thus employ his auto-suggestion to accomplish the result and this is really the most intelligent and powerful way of giving suggestions.

Your suggestion was exaggerated by his concentrated thought, producing unconscious action in the muscles of his back and legs. He was therefore actually in what is generally called the "hypnotic state," or "hypnosis."

To get a patient into a condition of receptivity or subjectivity it is necessary to get the senses inactive, and the most rapid means by which to accomplish this is to obtain concentrated thought, and to reduce the blood supply to the brain and to inhibit the senses.

It is a well-known and demonstrable fact that the more active the mind the greater is the quantity of blood supplied to the brain. The converse is also true, for to the same degree in which the blood leaves the brain is the activity of the mind decreased.

In delirium the brain is badly congested, the head is hot and the blood vessels are engorged. In this condition the senses become for a time extremely acute and the activity of the subjective mind is also seen in the ravings of the patient, frequently bringing forth from the recesses of the memory some long forgotten, trivial incidents of childhood, or whole passages in a foreign language, not understood by the patient, but which he must have heard at least once.

An old treatment for such a patient was bleeding. If you could watch such a patient bleeding to death you would see him pass through a variety of mental conditions, for starting with a return to his normal state of mind dizziness diminishes, fainting and coma would soon follow.

During natural sleep the conscious mind becomes inactive, and there is a corresponding diminution in the quantity of blood supplied to the brain.

When the mental and physical conditions of a receptive patient are understood, the methods generally adopted to induce the condition are absurd, as for instance gazing into the patient's eyes, bright objects, revolving mirrors, etc., etc.

The methods usually employed to induce such a condition, such as gazing into the patient's eyes, the use of bright objects,

etc., etc., are seen to be unscientific and absurd. They are the last evidences of the practical work of Braid and Mesmer clinging to our present *modus operandi*, although the same mental conditions are induced at the present time.

Mesmer and Braid recognized only the somnambulic condition, and not understanding the psychology of the condition and that it was induced by suggestion, thought the patient actually slept.

A committee of physicians appointed to investigate Mesmer's claims reported that the patients in whom he could induce the "trance" were imaginative and hysterical. Charcot, who also recognized but this "somnambulic state," made the same statement, and my own experience has satisfied me that somnambulists are all one and the same type. They make the most unsatisfactory patients in the long run, although it is among this class that miracles by faith healing, etc., are performed, for the conditions of which such a patient is relieved were really only present because he was so suggestible. Children, before they reason properly, make good somnambulists; but as education and reason increase they become less suggestible.

Show me a somnambulist and I will show you a man who cannot reason properly, and who is as a rule uneducated; and if educated, he is unable to apply his knowledge practically. A condition of deep suggestibility is neither necessary nor desirable where actual troubles are to be cured—it is a symptom.

I am in sympathy with the doctor who said he would not care to have the word hypnotism mentioned in his office. The word is meaningless, has a lot of wind clinging to it—in fact is like a dog with a bad name, and I should advise that it be dropped entirely.

Suggestion can be used without the knowledge of the patient or the use of the word hypnotism.

The best results from suggestion are obtained in the educated and reasoning classes by teaching the patient the value and means of employing auto-suggestions.

I would point out, in reply to Dr. Wilson's questions, that hypnotism is nothing but suggestion; and one may suggest to a patient who has his eyes either open or shut, but the strength of the suggestion will depend upon the degree of concentrated thought given to it and the auto-suggestion of the patient.

On account of the ignorance and prejudice extant, regarding

"hypnotism," it would not be advisable to suggest such a thing to your patient, nor to use any methods which might thereafter be questioned. However, all this can be avoided by adopting the methods I described for they can be used without the knowledge of the patient that the power of suggestion is assisting herself and her dentist and that this force is being intentionally and intelligently directed.

In reply to Dr. Gallic's question, I must say that it is unquestionably this same force, suggestion, which works the cures by christian science, or mental healing of any kind. In fact, some of the most brilliant cures made by our so called regular schools of medicine have been due to this same force, although the credit has been placed elsewhere.

I have studied christian science thoroughly and find it teeming over with suggestion from beginning to end.

Replying to Dr. Bentley, I will say that I am of the opinion that pain is due to the mental perception of an injury.

Pain is a degree of sensation, but its degree of severity depends greatly on individual interpretation. There is no scale by which we can measure pain, for no two in a dozen would interpret a given sensation in the same way.

Normally one is not cognizant of the chemical actions continually taking place in the tissues of the body because he is accustomed to these sensations from birth, and they feel as natural as his clothes on his back, but when from injury the natural course of events is interrupted he becomes conscious of the "lack of sensation," and this produces a sensation and the attention is called to it.

A CASE OF PHOSPHORUS-NECROSIS.

Dr. Theodore A. McGraw (*Pharmacology and Surgery*, Vol. XIX, No. 5) reports that a man, aged thirty-nine, had worked for years in a match factory. In June he had a tooth extracted on account of decay. He had no trouble from the latter until the end of September, when he began to have a pain in the left side of the jaw. As the pain increased in severity the jaw became swollen from the formation of abscesses. They were opened and drained with no relief but an increase in the severity of the pain and swelling. On January 4 the left side of the face and neck was enormously swollen, a fetid discharge running from the mouth and outside openings, and a very pale, anemic and exhausted patient. He was taken to St. Mary's Hospital and operated upon. The jaw was found entirely detached on the left side from symphysis to joint. It was sawed through in the middle and then peeled out without any trouble. This was a case of phosphorus-necrosis, not uncommonly found in persons suffering from decayed teeth or recently extracted teeth, who are employed in match factories. This patient is rapidly recovering.

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THE NEW YEAR.

After such a long period of professional drouth the year 1898 looms up with vast encouragement for the future. Everywhere we see signs of prosperity and the air is full of hope for every one.

Do not be dismayed if you have made failures, but try and succeed the next time you essay to do even the smallest thing. Close up the old accounts, strike off those that are bad, find what your professional assets are and work with enthusiasm to excel all previous records in everything. The DENTAL REVIEW sends its greetings and wishes for one and all of its friends a "Merry Christmas and a happy New Year."

CLOSE OF THE VOLUME.

With this issue the DENTAL REVIEW closes the eleventh volume. Looking back to the day when the first number was issued in November 1886, we hope we have cause for thinking that this journal has had such a successful career. During the eleven years of its existence more than ten thousand pages have been devoted to

the publication of original papers, letters and proceedings of societies, designed exclusively for first publication in our columns. We are glad to be able to state that the publishers have always been willing to properly illustrate all articles needing such means of amplification. They have never hesitated to go to any reasonable expense to make this one of the leading journals of the world. To the contributors who have so kindly favored us with papers, letters and other valuable matter we return our sincere thanks.

It is no easy task to present from month to month, new, unpublished material, but with good assistance and a determination to do it we think we have succeeded. We expect to present to our readers much valuable matter during 1898, superior to that of 1897, with the aid of our vast army of contributors.

DRUG TOLERATION.

During the past few years the writer has noticed that many mouths bear the mark of local drug toleration. This is more especially noticeable when for some reason the person habituated to the use of washes and lotions discontinues the habit. We will see then that the saliva and mucus is less copious than when the drug or combination of drugs is dispensed with.

The more general use of mouth washes and liquid dentifrices does not date back much beyond the period of the introduction of antiseptic surgery. Formerly the washes and mouth lotions were gotten up to have an agreeable taste and a perfumery odor. Latterly the majority of them make a pretense at least of being powerfully antiseptic. In many cases such claims are preposterous as the antiseptic and disinfectant is barely strong enough to destroy the most innocent microbe. In a state of health and normality of the mucous membrane, what need exists for the use of such substances. Would not warm water and then cold be even better than the artificial stimulation of the mucous membrane which after a time craves such stimulation. Would it not be more beneficial to humanity if the washes and pastes and lotions were only used to correct a disorder than to use them to keep up a disagreeable and hurtful habit. We do not decry the use of such substances when needed to assist nature to a return to health, but we protest against the whole population being told that it is a necessity—that such general use is beneficial, etc., etc. The normal mouth not contaminated with tobacco or chewing gum is much better

with water, hot and cold, and the sparing use of the toothbrush—which is one of the abominations of civilization—than to be fed daily with sprays, lotions and pastes of uncertain constitution.

PAMPHLETS RECEIVED.

Proceedings of the National Association of Dental Faculties, Old Point Comfort, Va., 1897. J. H. Kennerly, Secretary.

Proceedings of the Iowa State Dental Society, 1896 and 1897. Pages 331.

The souvenir number of the *Items of Interest*. This is a full account of the Twin Mountain meeting, held last July by the *Items*. It is very readable.

PRACTICAL NOTES.

PULPITIS.

TO THE EDITOR.

Dear Sir: In reply to your letter, I will write you of my experience with a case of pulpitis which I had last month. A lady came into my office early in September, saying she was having trouble on the right side, pointing to the interproximate space between the second bicuspid and first molar. She said the pain was located there. I made a careful examination and could find no cavity. The pain was not severe, so I told her it was probably only temporary. While I was absent from the city she had a recurrence of the pain and consulted another dentist. He was under the impression that there was a cavity in the first molar. However, she did not have anything done that day. When I returned she came to me again. She came in very much excited, and began to take me to task for overlooking a cavity and allowing her to suffer this pain. I told her to take a seat in the operating chair. She pointed definitely to the second bicuspid. I examined it and could find no cavity in either the first molar or second bicuspid. My method of diagnosing these cases is this: I use heat instead of cold. I take a cone of heated gutta-percha which is tenacious and I think preferable to a hot instrument. It will cling to the surface of the tooth. I applied this to the second bicuspid and she flinched. I said, "Is that the character of pain you have been suffering?" She replied "No." I went from one tooth to the other till I came to the third molar, which had a large

oxyphosphate filling in it. I applied the heat to this tooth and she exclaimed, "There, doctor, that's it; I told you all the time that tooth was hurting me." She then placed her finger on the second bicuspid. I drilled through the oxyphosphate filling and struck a case of pulpitis. I destroyed the pulp and filled the canal in the regular way. This is just an instance illustrating the fact that we cannot always rely on the patient's word about the condition of their teeth.

W. F. HUDDLE, D. D. S.

OXFORD, IND.

MAKING FEMALE DIES FOR CROWN SWEDGING.

In making female dies by pouring Melotte's metal upon the imbedded tooth, it will be found that the underside of the ingot, including the surface of the die, is exceedingly rough, while the upper surface of the molten metal was smooth as that of a globule of mercury.

Now, if you would have a die sharp and smooth as if cut by a graver, cut a hole through a piece of thick card with plate nippers or otherwise somewhat the shape of the tooth crown. Push the tooth through the card as far as you would have the die to be deep, keeping the tooth upright by banking modeling compound softened by dry heat about its roots, or if an artificial tooth its under part. Push into your rubber casting ring a piece sawed from an old broom handle, leaving sufficient depth for the thickness of your die. Now melt your metal and fill your ring, more than full, skimming the surface of the metal free from dross. Press the imbedded tooth into the molten metal, at once pour cold water upon the whole affair. Keeping the tooth firmly in place and the work is done and if you are not pleased with the result I miss my guess?

J. H. HUGHES, D. D. S.

GOSHEN, IND.

SPECIALTIES IN DENTISTRY.

BY J. J. GROUT, D. D. S., ROCK RAPIDS, IOWA.

In the professional life of nearly every dentist there is a time when, in the eager pursuit of that which is new, he becomes careless or indifferent to that which is old. Some will make a specialty of one or two things and almost ignore all else that goes to make up a good all around dentist. In large cities that may do, but in small cities nearly if not all of us are obliged to do something in nearly every branch of our profession.

I shall ever remember the words of Dr. Ingersoll, of Keokuk, in one of our meetings, I think it was at Des Moines, twelve years ago, he said: "Make a specialty of everything you do ; try to excel in everything."

In dentistry, as well as in other pursuits of life, a man must be made for the place rather than the place for the man. Some dentists will excel in some particular thing, perhaps gold filling, bridge or crown work, or perhaps prosthesis. Often we will find dentists who will put in a good amalgam filling and a poor gold one, and again others who will do nice gold work and poor amalgam. The latter, I believe, is due to indifference, as it seems impossible that a man being capable of doing good gold work should be incapable of doing good amalgam work, while with the former class it may be an utter impossibility to do good gold work. It is to the class of good gold workers and poor and indifferent plastic workers that I wish to say a word. I know that there are men who think that any filling material other than gold is merely a makeshift, or at least temporary. Then there are others that go to the other extreme, but to my mind a man who takes a medium course, uses gold when indicated, and amalgam, cement and gutta-percha when indicated, will in a series of years be the most successful in saving all classes of teeth. To be sure, men who claim to belong to the medium class will differ as to when these different materials are indicated, but not to any great degree. What I wish to emphasize is, that we should do as Dr. Ingersoll advised, "make a specialty of all we do." Not only condense and finish to perfection a gold filling, but bestow as much care and skill on amalgam and cement fillings in proportion as they may require it. I might go on and give reasons for the faith that is in me; tell why I believe the plastics have their legitimate uses as well as gold in dentistry, but this ground has been gone over many times by some of our most distinguished men. This, together with an experience of twenty years' practice has convinced me that, using careful judgment in the selection of material, doing the work thoroughly and well, the greatest number of teeth can be saved, and that with the least pain and expense to our patrons.

I have noticed many times in teeth cared for by dentists of good standing, amalgam fillings apparently stuffed in regardless of all scientific principles; in proximal cavities the space between filled full, often crowded down so as to occupy the interproximate

space; cavities often filled too full, the material lapped over and beyond the cavity margin, the feather edge breaking away, leaving a rough ragged edge; food collecting and decomposing, soon causes decay and necessitates refilling. This is what most any of us would call temporary work. I belong to that class of dentists who do not claim perfection, but will acknowledge an occasional failure, learning from our own and others' failures more in proportion than from our successes. We all have our own *modus operandi*, and while we may differ much in methods and means, some possibly being far from what is taught in our best schools of to-day, still, what is there to quarrel over if we but secure the desired results. All ways are good that lead to the desired haven. I have a way of mixing filling materials, which some might criticise, but have proven it good in my hands. Often when a pulp is nearly exposed, I line the cavity over the pulp with Gilbert's stopping or gutta-percha, cover this with cement, let harden, then fill with gold or amalgam. Other times, if in a molar or bicuspid, where I wish to use amalgam, and the tooth is very frail or sensitive, I mix cement medium thin and place in the bottom of the cavity, then pack into the amalgam while the cement is yet soft. Occasionally I mix amalgam and cement together before introducing. This I use in cavities difficult of access and sensitive, doing away with the necessity of retaining grooves, and it is only a partial conductor of thermal changes and wears well. Oxyphosphate, when indicated, is one of the best of filling materials. As a rule, we would not expect it to last more than a year or two, but in some mouths it proves quite permanent, lasting from five to ten years. I use a great deal of it and with good results. In the selection of filling material, one should use judgment, the best being poor enough. The great trouble is to find which is the best. Every manufacturer will tell you his is the best, but experience will determine that, I believe the manufacturers are giving us the best they can for the money, and cater to each individual's preference. They offer us vast variety of both instruments and material, and it lies with us whether they are used to the best interests of our patrons and to our own best good.

We all have our ideals of excellence, and every conscientious dentist will in every operation try to reach as near as possible that degree of perfection he has set up as a guide and rule of conduct. We may have the best of material and instruments, but unless the

cavity has been properly prepared, and the filling properly introduced, we will not obtain the best results. It is comparatively easy to say, use good material and put it in the cavity as it should be; it is much more difficult to explain to a body of men just what you mean by such language. As I am speaking more particularly of plastics, I shall not attempt to explain my method of preparing cavities for gold. Dr. C. N. Johnson, of Chicago, is professor of operative dentistry in the college I attended, and, believing him to be authority, I try to imitate him. He has written voluminously on that subject, so nearly every dentist in the country is familiar with his manner of preparing cavities for filling with gold. In filling with amalgam, especially in crown and proximal cavities that extend to the occlusal or cutting edge of the tooth, I trim all frail margins away until I consider the overhanging enamel and dentine, if any, strong enough to withstand the force of mastication, leaving the cavity margins at right angles with the surface of the tooth and parallel with the enamel rods, bevel slightly with bur or excavator, and fill. As the majority of my patrons live in the country, making it impossible for another appointment to refinish the filling if I desired, I use great care in finishing at first sitting. Am particular to finish flush with cavity margins, leaving no overlapping of material, thus preventing rough and ragged margins for food to accumulate about, which would in a short time induce a recurrence of decay. In proximate cavities I am not so particular about trimming away frail margins beyond the occlusal surface or where there is no pressure brought to bear, depending more on the cervical and occlusal portion of the tooth as anchorage for the filling. Contouring or restoring teeth to their natural shape is an important feature. I use celluloid almost entirely as a matrix, thin or thick as the case may demand. It being flexible, with a burnisher you can bend the matrix, contouring perfectly, leaving a finished surface and narrow space, as nature intended. The idea of using celluloid, I received from Dr. Peterson, of Dubuque. I would hardly know how to get along without it now. These matrices can be used with any kind of filling material, especially are they of great value in working cement.

Oxyphosphate can be used with pleasure and profit to both patient and operator in a great many instances. I use it often in the anterior teeth when the patient cannot afford gold, where the teeth are very sensitive, in children's teeth and in very frail teeth

where they would not hold a metal filling necessitating undercuts, to cap nerves, to hold amalgam in cavities having little or no retaining grooves, to mend broken casts in bridge, crown and regulating work, etc. I often use it in the anterior teeth where they overlap making it difficult to put in a good gold filling, and where the face of the tooth is very thin so a metal filling would cause it to look dark. By using the celluloid matrix you can pack, finish and contour perfectly, insuring a moisture proof filling and one that looks well. Cement is almost indispensable in preserving what we term soft or chalky teeth. By refilling and patching, this class can be preserved for years, this being preferred by many to wearing artificial dentures. Gutta-percha I use but little as a filling. Occasionally in buccal cavities of bicuspid and molars, and in deciduous teeth, also as capping for exposed pulps, lining for sensitive cavities and in root filling.

The one thought to which I have been endeavoring to attract your attention is, that we must not forget, in our extreme desire to keep at the front in our profession, to bestow as thorough and conscientious efforts on a minor operation as we would on the more difficult ones. Remembering that it is the careful observance of the little things which go to make the successful practitioner in any profession. What is worth doing at all is worth doing well.

MEMORANDA.

Dr. G. V. I. Brown, of Duluth, visited Chicago in November

Dr. Harrison Allen, of Philadelphia, a frequent contributor to the dental press, is deceased.

The lactate of silver in solution 1 to 15 stains white paper, cotton, silk, etc. It appears to be useful in the treatment of suppurating pyorrhœa pockets.

Holocain in 1 per cent solution is an active but superficial local anæsthetic. If it is used every five minutes the insensibility will continue. Useful in pyorrhœa pockets, on the pulp, etc.

Some of our Northwestern dentists will be going South this winter to Florida, North Carolina or Old Point Comfort, and if they wish to travel easily and comfortably they will go by the "Big Four" from Chicago.

Last month the editor was not at home. The errors which crept in in the spelling of names, etc., was overlooked by our assistant (temporary) editor and that is why Emma Eames Chase should have been read instead of Harper.

CORRECTION.

In our report of the proceedings of the Northern Illinois Dental Society in our November issue we omitted to mention that Dr. F. T. Bell, of Aurora, read a

paper on Signs of the Times, which we regret exceedingly, as it will appear in a future issue of THE DENTAL REVIEW.

ROCKFORD ODONTOLOGICAL SOCIETY.

In the report of the organization of this society, on page 891, of the November number of THE REVIEW, it is erroneously stated that the above society is an auxiliary of the Chicago Dental Society, when it should read: "Auxiliary of the Odontological Society of Chicago."

TO THE EDITOR OF THE DENTAL REVIEW.

Dear Doctor: I see in the News Summary of the November *Dental Digest*, p. 759 a note "Imitation the Sincerest Flattery," in which it states the *Dental Digest* was the first dental journal to have a regular letter from different parts of the country each month, and the DENTAL REVIEW is now following our [their] lead. I thought the DENTAL REVIEW published such letters long before the *Dental Digest* was ever dreamed of. Gentlemen, if you want to keep up with the procession you must get in the band wagon. Yours truly,

SMILAX.

NATIONAL ASSOCIATION OF DENTAL TECHNICIANS.

The fifth annual meeting of the National School of Dental Technicians will be held at the Palmer House, Chicago, December 29 and 30 of this year. Its program will entitle it to even greater success than experienced at any time during its previous years of existence. Its leading paper, from Dr. G. V. Black, on "Instrument Nomenclature, with Reference to Instrumentation," will mark a historical period in methods of teaching the manual of cavity preparation.

D. M. CATTELL, *Sec'y-Treas.*

HENRY W. MORGAN, *Pres.*

ODONTOLOGICAL SOCIETY, OF CHICAGO.

The Odontological Society, of Chicago, elected the following officers for the ensuing year at its last annual meeting, Tuesday, Nov. 16, at Leland Hotel: J. G. Reid, President; E. A. Royce, Vice President; Elliott R. Carpenter, Secretary and Treasurer; P. J. Kester, Curator of Museum.

A. W. HARLAN,

C. S. CASE,

P. J. KESTER.

} *Board of Censors.*

ELLIOTT R. CARPENTER, *Secretary.*

ECONOMY IN HYPODERMIC NEEDLES.

TO THE EDITOR OF THE *Medical Record*.

Sir:—Thousands of hypodermic syringe needles are thrown away each year as useless by members of the profession, which could with a slight amount of trouble be restored to their original state. The channel of the needle becomes occluded, owing to the deposition of material derived from the injection fluid. This precipitate is readily dissolved and removed by boiling the needles for a period of ten minutes in a solution of sodium carbonate, which not only cleanses the needle internally, but restores the brightness of the external surface as well.

Red Bank, N. J.

ADOLPH G. BROWN, M. D.

The Southern Dental Association (as a branch of the National Dental Association of America) will hold its first annual meeting at the Ponce De Leon Hotel, St. Augustine, Fla., convening February 22, 1898. Officers for 1897-'98:—President, Dr. E. P. Beadles, Danville, Va.; First Vice President, Dr. W. E. Walker, Pass Christian, Miss.; Second Vice President, Dr. T. P. Hinman, Atlanta, Ga.; Third Vice President, Dr. F. P. Welch, Pensacola, Fla.; Treasurer, Dr. B. D. Brabson, Knoxville, Tenn.; Corresponding Secretary, Dr. C. L. Alexander, Charlotte, N. C.; Recording Secretary, Dr. S. W. Foster, Atlanta, Ga. Executive Committee:—W. T. Arrington, Chairman, Memphis, Tenn., one year; R. K. Luckie, Holly Springs, Miss., one year; W. R. Clifton, Waco, Texas, two years; H. E. Beach, Clarksville, Tenn., two years; V. E. Turner, Raleigh, N. C., three years; S. B. Cook, Chattanooga, Tenn., three years. Committee of Arrangements:—S. W. Foster, Chairman, Atlanta, Ga.; C. H. Frink, Fernandina, Fla.; S. Ewing Smith, St. Augustine, Fla.

NORTHERN ILLINOIS DENTAL SOCIETY.

To the President and Members of the National Dental Association, and to the President and Members of the National Association of Dental Examiners.

Gentlemen: At the tenth annual meeting of the Northern Illinois Dental Society held at Rockford, Ill., October 20 and 21, 1897, the undersigned were appointed a committee to draft and present to your associations suitable resolutions, with a view to remedy an existing evil regarding the interstate practice of dentistry, and we herewith submit the following for your consideration.

WHEREAS, A legal practitioner of any one of the United States, who desires to remove to another State, is, under the existing laws, compelled to comply with certain requirements of the dental law of that State; and

WHEREAS, In many instances such legal practitioner (sometimes of many years' experience) is subjected to a more or less severe theoretical examination, which cannot even be successfully passed by many who are fresh from the college halls, therefore be it

Resolved, That the National Association of Dental Examiners and the National Dental Association, be and are hereby requested to enact such rules, or to secure such modification of the dental laws of the various States, which, under reasonable restrictions, will enable competent practitioners to remove from one State to another without being compelled to submit to provisions which are eminently unfair to a large number of capable dentists.

Dated, November 10, 1897.

Attest:

JAMES W. CORMANY, *Secretary.*

LOUIS OTTOFY,
W. H. TAGGART, } *Committee.*
M. L. HANAFORD. }

DRESSING SUPPURATING WOUNDS WITH SODIUM CARBONATE.

Dr. Guéorguievsky, a Russian army physician (*Med. Week*, V. p 131), has made the important observation that compresses, soaked in a 2 per cent solution of chemically pure sodium bicarbonate, covered with some impermeable tissue, will stop purulent secretion and arrest phlegmonous inflammation more rapidly than all ordinary antiseptics, such as carbolic acid, iodoform, etc.

He discovered this remarkable property of sodium bicarbonate accidentally in a case of whitlow. There were phlegmonous inflammation of the index finger with extension to the palmar aspect, and edematous swelling of the back of the hand and of the lower third of the forearm. The finger was incised, and a great quantity of pus issued from the opening, which was afterward washed and plugged with a band of gauze, impregnated with iodoform ointment (iodoform, 2 gme., balsam of Peru, 4 gme.; oil of peppermint, 4 drops; vaselin, 15 gme.), and the whole covered with an antiseptic dressing. In the evening of the same day, the suppuration was still very abundant, the palm of the hand very painful and of a leaden color. A sound was introduced into the opening, passed up beneath the tendon of the common extensor of the fingers and on for 8 centimeters under the soft parts of the palm. Dr. Guéorguievsky wanted to make a counteropening at this point, but only succeeded in scratching the thickened epidermis, the patient having suddenly withdrawn his hand.

The surgeon then decided to postpone the operation, and, in order to soften the tissues, ordered the whole hand to be enveloped in gauze compresses, soaked in a 2 per cent solution of sodium bicarbonate. Next morning, on examining the hand, he was extremely surprised to see that the condition was very different, there was no pain, no redness, no swelling of the parts, there was no trace of any suppuration on the dressing or in the wound, and not a drop of pus could be brought out by pressure on the finger or on the palm. The compresses, which the patient called "magical", were continued, and the cure was completed in an extremely short time.

Since then, Dr. Guéorguievsky has often treated in the same way cases of whitlow, or of other circumscribed or diffuse phlegmonous inflammation. He first incised the purulent collection, gave issue to the pus, and covered over the surface

of the open wound and the whole inflamed region with compresses soaked in a 2 per cent solution of sodium bicarbonate. In every instance, the pain and the suppuration were arrested, and cure was rapidly completed without the use of any drainage, which is so often the cause of intense suffering to the patient. In several cases it was possible to prove by direct experiments the superiority of sodium bicarbonate over the antiseptics which are in common use in the treatment of inflammatory lesions. Whenever, in these cases, the sodium bicarbonate was stopped and the iodoform ointment applied, the suppuration at once returned, but ceased again as soon as the sodium bicarbonate dressings were reapplied. F.

THE LAYMAN'S VIEW OF IT.

"*Esteemed Friend:*—You may wonder that I have not been to see you since my return, to get the cavities in my plate filled. The reason is that I am still studying over the possibility of an improvement in the general situation. I really wonder whether there ever has been such a thing as a perfectly satisfactory under set of artificial teeth. Mine seem to fit as well as I have any reason to expect, and yet when eating I am never permitted to forget them for an instant. This has led me to study the philosophy of the difficulty, and I think I have the explanation.

"Artificial teeth are simply tools with which the tongue and jaws do a certain amount of crushing and knocking to pieces. In the process the upper plate serves the part of an anvil, and the lower that of a hammer. It seems not difficult to set the anvil firmly on its bed, and by means of suction to hold it there with considerable force. But dentists do not seem to have discovered any means of enabling the operator to grasp the hammer. In mastication the situation would be about paralleled if a man were to crack nuts by striking upward with a piece of iron fitted to a portion of the back of his closed hand, but not fastened to it. Every time he struck the hammer it would shift a little, and would have to be readjusted to be perfectly easy for the next stroke. The friction of readjustment would tend to wrinkle the skin and make it sore in spots. Then every little while a bit of shell would get under the hammer, or between it and the hand, and would have to be removed before he could strike another blow. You would not be surprised to hear a man say under such circumstances, 'It makes me tired. I would about as lief go without nuts as to crack them with this machine.'

"Now, if you want to write an article for some dental journal on the upper and lower teeth as anvil and hammer, you may understand that there is no copy-right on the above. But the great question is, Is there any remedy? The profession must answer this. The only thing that comes to my mind is to wonder whether lower plates with soft rubber attachments and adjustments have been fully tested.

Yours meditatively."

Of "microbes," "germs" or "bacteria," Dr. Woodward, in the *Lancet*, says: "The tendency has been to accept them (bacteria) as the ultimate causes of certain forms of deadly disease and as promoting the evolution of putrefactive products; whereas, as a matter of fact, they are instrumental in keeping the world sweet and clean for its inhabitants and in maintaining a constant circulation of organic matter from the dead condition to the living and from the living to the dead. It is interesting to reflect that without the aid of bacteria the human race would be unable to continue its existence, the animal and vegetable world would long since have perished from sheer inanition and starvation, and the work of the world as a laboratory would have come to a standstill."

As first promulgated this (germ theory) was delightfully simple; viz., that every contagious disease is due to a specific germ. No microbe, no disease; eliminate the former and the latter is at once relieved. Latterly the fact has been recognized that the microbe is frequently found and the disease is as frequently absent. In order to meet the occasion the bacteriologists now assume that it is not the presence of the germ, but some virulent condition of the microbe which causes the disease; in other words, the diseased condition is common to both the germ and the patient.—*Medical Age*.

IN MEMORIAM.

RESOLUTIONS PASSED AT A MEETING OF THE CHICAGO DENTAL SOCIETY,
OCT. 5, 1897.

WHEREAS, The change so rapidly taking place among the pioneers of our profession has been so conspicuously marked in the death of Dr L. G. Ingersoll, of Keokuk, Ia.

Dr. Ingersoll was a leader in the profession and contributed largely to its literature. His standing as a man of broad education gave him a prominent place among educators and literary people, and commanded the attention of all audiences which he addressed.

Dr. Ingersoll was not only a scholar, but he was an earnest worker and an eloquent speaker.

Resolved, In the death of Dr. Ingersoll the profession has lost another distinguished member whose life work was in the interest of a higher educational standard.

Resolved, That a copy of these resolutions be placed on the records of this society and published in the dental journals, and that a copy be forwarded to his family.

TRUMAN W. BROPHY, }
J. H. WOOLLEY, } *Committee.*
C. S. CASE.

WHEREAS, Again we are called upon to record the name of a distinguished American dentist among those whose life work is finished and whose achievements form a conspicuous part of the history of dentistry the last quarter of a century.

The life of Dr. Frank Abbott was one of great worth to dentistry in America.

During a period of about thirty years he was at the head of the New York College of Dentistry, and with this institution—one of the foremost in our country—his name will ever be inseparable.

Dr. Abbott was honored by election to the Presidency of the American Dental Association, the Association of Dental College Faculties and other bodies with which he was connected and was recognized as one of the leading men in the profession.

Resolved, That in the death of Dr. Frank Abbott the dental profession has lost a member whose affability won him our friendship, and whose earnest efforts in advancing dentistry among practitioners and as an educator placed him among the foremost men in the profession

Therefore, be it Resolved, The Chicago Dental Society deeply regrets the untimely death of Dr. Abbott, and conveys herewith its sympathy to his family in their bereavement;

Resolved, That a copy of these resolutions be spread upon our records and a copy be sent to the dental journals and to his family.

TRUMAN W. BROPHY, }
J. H. WOOLLEY, } *Committee.*
C. S. CASE.

DR. THOS. W. EVANS.

A noted and unique figure in the history of dentistry has passed away by the death of Dr. Thomas W. Evans, which occurred Sunday night, Nov. 14, 1897, at his house in Paris of angina pectoris. Dr. Evans occupied a position absolutely without parallel, or similarity even, in the history of our profession, and the world will never see another such a career. He came to Paris in 1847 and became associated with Dr. Brewster in the practice of dentistry at No. 15 Rue de la Paix. When Louis Napoleon became president of the French Republic in 1848, Dr. Evans was fortunate enough to secure him as a patient, and later on became his friend and in many things his adviser. By his affability and tact he rapidly distinguished himself in his profession and eventually came to have as patients more crowned heads than it has ever fallen to the lot of any other professional man to treat. Many of them became his friends and up to the time of his death he was constantly receiving from one or another some souvenir of grateful friendship. Only two weeks before his death he went and spent a week with the Grand Duke and Duchess of Baden, whose sympathy for him on the recent loss of his wife was thus amicably shown.

Dr. Evans died very rich, his fortune being variously estimated at from \$10,000,000 to \$12,000,000. To us as professional men Dr. Evans' chief glory will be that he always prided himself upon being a dentist, and was never ashamed to identify himself with the profession. Some six years ago Dr. Evans paid the writer the great compliment of being his patient, and as a consequence we have seen much of each other.

Upon one occasion, when we were lunching together after a long and rather fatiguing operation upon his own teeth, he spoke of his position and of his fortune, etc., etc., and among other things he said that he had often been adversely criticized for remaining in active practice, adding, "I have done so because I have always wished to be known as a dentist as long as I lived, and the chief aim of my life has been to make my profession respected and honored by the highest." How well Dr. Evans has succeeded, we who knew him intimately well know.

J. H. SPAULDING,

4 Rue de Rome, Paris.

WHEREAS, the Allwise Ruler of the Universe has, in His infinite wisdom, removed from our midst an esteemed fellow laborer in Dr. A. G. Hayden; and

WHEREAS, The Hayden Dental Society keenly feel the loss of a valuable member and an earnest worker, a faithful colleague and a true friend;

Resolved, That the removal of such a man from us leaves a vacancy that will be deeply felt by all; be it further

Resolved, That we extend to his bereaved family and relatives our earnest sympathy and mourn with them in this sad affliction.

T. ELHANAN POWELL,	} Committee.
A. J. OAKLEY, D. D. S.,	
M. B. RIMES, D. D. S.	

OBITUARY.**DR. THOS. W. EVANS.**

Dr. Evans died at his home in Paris, France, on Sunday evening, November 14 last, and with his demise there has passed away one of the most noted characters in dental history. The immediate cause of death was angina pectoris, after an illness of less than twenty-four hours' duration. Although Dr. Evans was nearly seventy-four years of age, having been born in Philadelphia, Pa., December 23, 1823, the news of his death came upon his friends like a thunderbolt from a clear sky. Albeit the sorrowful mission—the final disposition of the remains of his wife—which brought him to the United States, had severely affected his mental peace, he still retained the rugged physical strength which had been his good fortune during his long and successful career. He was in Chicago on Tuesday and Wednesday, the 28th and 29th of last September. On Tuesday evening he was entertained at dinner by a few of the members of the Odontological Society, and on Wednesday at noon he met some members of the profession of Chicago, among whom was the writer.

Dr. Evans occupied a singular position in dentistry, he was more generally known among the people of the world than any other dentist of the past or present, and yet he was not, in the ideal sense of the word, above the average in skill as an operator, but he grasped opportunities presented to him and made the best of them, possessing in a high degree the gift of making and holding friendships, of maintaining silence when confided in, and an easy, gentle manner, which, with his polish as a gentleman, soon opened the most exclusive circles of the French capital to him.

The story of his life has been frequently written, and like the lives of most men who occupy prominent places, as public or semi-public men, numerous anecdotes and fabulous stories, have been woven about the life which, even in its naked truth, was full of romance. Briefly, born of humble parents, receiving a common school education, apprenticed to a goldsmith graduating in medicine, learning dentistry, he exhibited some specimens of his skill at a small country fair. This attracted the attention of the then leading American dentist of Paris, Dr. C. Starr Brewster, formerly of South Carolina, who secured him as an assistant in 1846; he succeeds to Brewster's lucrative practice, forms the acquaintance of Napoleon III., and through him becomes the dentist to the majority of the royal families of Europe, with many of whom he was not merely on terms of professional acquaintance, but an intimate personal friend and confidant, from whom they could often learn more truthfully the state of the public mind, than from interested courtiers and hirelings, or a subsidized or fearing press. In this wise his career extended over a period of nearly fifty years.

The most eventful occurrences during this period, are those relating to his philanthropic interest in the Red Cross Society, and the alleviation of suffering during times of war. His influence upon the weak mind of the little Napoleon, in preventing the recognition of the confederacy during our civil war, and the assistance rendered the Empress Eugénie during the turbulent times following the fall of the empire. These have been so frequently detailed that it is unnecessary here to recount them.

Dr. Evans has everlastingly enshrined his name in the cause of the humane and philanthropic; he went to the Crimea and studied the sanitary conditions of the field, and rendered valuable aid in their improvement, as he likewise did, during the Franco-Prussian war, he established and maintained from his own purse the Lafayette Home in Paris, for the housing and support of American girls studying art in Paris, and his acts of charity and philanthropy extend over his entire life, and embrace assistance rendered to people in all stations of life, as many Americans stranded in Paris, can testify.

As a semi-diplomat, he has no doubt frequently exerted his influence as the power behind the throne, and many times prevented friction by a kind, yet apparently indifferent word spoken at the proper time. His autobiography to be published posthumously, will no doubt prove interesting from this standpoint, and add to the completeness of the history of France during the momentous periods which he was permitted to witness.

It is to the credit of Dr. Evans, that notwithstanding the opportunities and emolument and honor offered to him if he would renounce his American citizenship, during an expatriation of over fifty years, he remained steadfastly an American citizen, and that it is his wish that his remains shall lie by the side of his wife, in the city of his birth, in American soil.

It is beyond question that the life of Evans in Europe has been the principal source of the high esteem in which dentistry stands to-day, not only abroad but in our own country. The high reputation attained by American dentists abroad only led to a recognition of the skill of Americans by our own people, and thus his influence may be said to have been felt to a marked degree on both sides of the Atlantic. Americans at once reasoned that if an American dentist was good enough for the crowned heads of Europe, he might be good enough for the uncrowned heads of America.

The press has been teeming with statements regarding the amount of Dr. Evans' fortune, since his death. It has been variously estimated at from five to thirty-five millions of dollars or francs, (as though there was no material difference in the value of the two standards.) In the absence of authentic reports, it is only possible to conjecture, while it is no doubt a handsome figure, it is probably overestimated as is so frequently the case with the wealth of many rich men. Whatever it may be it is certain that Dr. Evans, in the absence of direct issue planned to devote a large amount of it to certain projects, among them his favorite, the LaFayette Home in Paris, and the endowment or establishment of some school devoted to dental science, a dental museum, etc. His practice will fall into the hands of a nephew, and no doubt his numerous relatives in this country and Europe will come in for a good share of the estate.

It is barely possible however, that Dr. Evans, had not fully completed his plans, that the summons came a little too soon. He had but just returned from the United States, where he was studying various plans of endowment, etc., some of which it seems almost impossible to have been mature before his return and death. It must also be remembered that the fortune will be materially decreased by the share which falls to France, under the French laws, according to which a large percentage of the estates of the aliens, become the property of the Republic.

LOUIS OTTOFY.

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